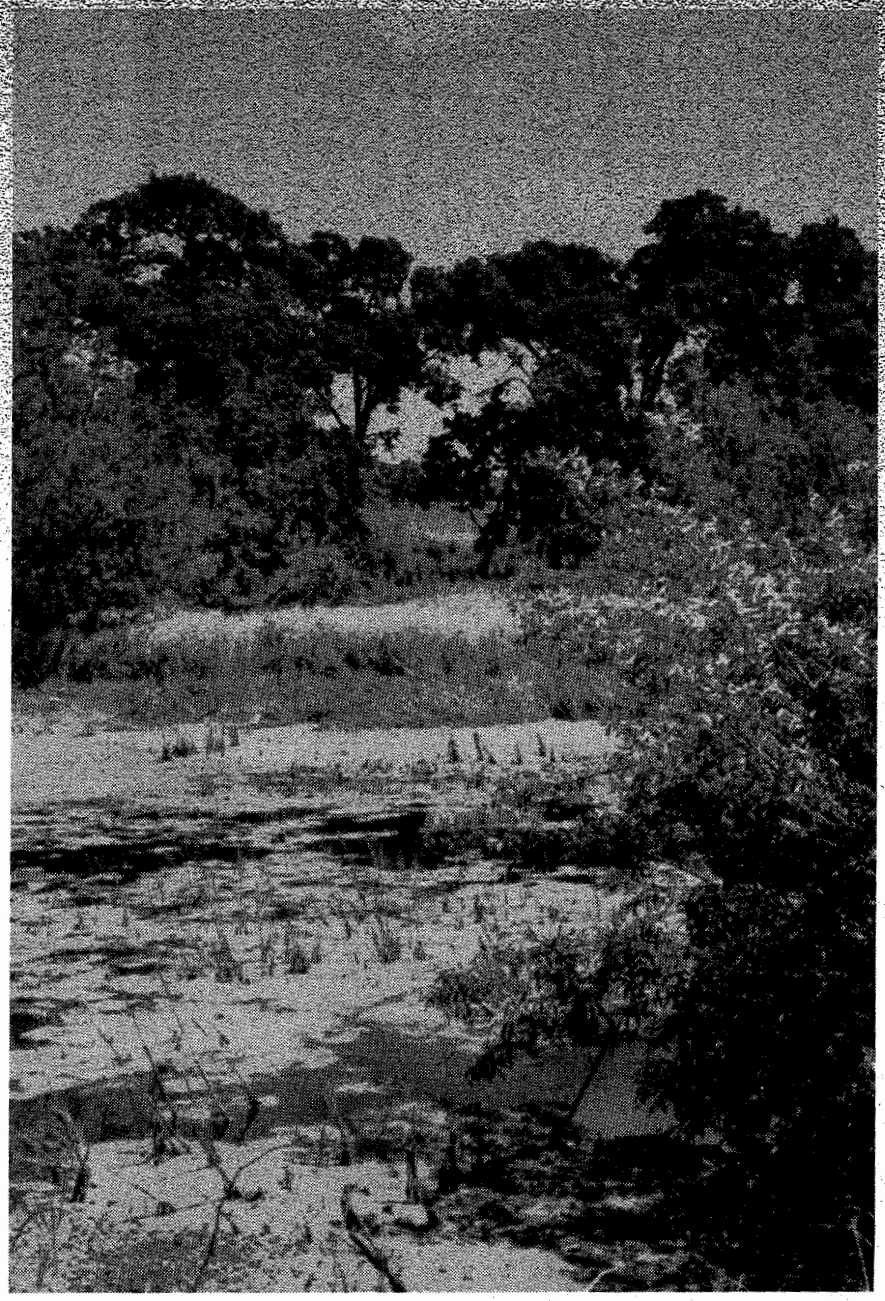

City of Sebastopol

Laguna de Santa Rosa Park Master Plan

VOLUME 2
TECHNICAL INFORMATION
DRAFT

Prepared by
Hyden Associates
Landscape Architecture
&
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EXISTING CONDITIONS

SOILS AND GEOLOGY

Geology

The down faulting of the Santa Rosa Valley, which began approximately one million years ago during the Pleistocene epoch, has helped cause the low gradient of the Laguna de Santa Rosa and its tributaries. The low energy of streams in the valley favors the deposition of sediments and the development of wetlands. The predominant surface geology in the study area is fine-grained alluvium, indicative of wetland origins where small particles suspended in the currents of the Laguna settle out (Helly et al, 1979). The distribution of these deposits corresponds with the historic boundaries of the pre-settlement riparian forest and freshwater marsh.

Soils

In the study area, surface geology, water regime and vegetation are the dominant influences in soil formation (Helly et al, 1979; Waaland, 1989). Following is a description of the different soil types of the study area.

ClearLakeClay. This floodplain soil is derived from fine-grained alluvial parent material which settled out of the still Laguna floodwaters as "basin deposits." It is the most extensive soil within the study area. Permeability is very slow and runoff would be high but the flat terrain causes water to pond. The Clear Lake Clays are considered hydric soils because of their prolonged saturation.

Blucher Loams and Pajaro Clay Loam. These soils are found on low terraces and alluvial floodplains of the study area. For instance, Gravenstein Creek deposits coarse and medium-grained alluvium when high flows empty into the still floodwaters of the Laguna. Theses deposits also occur where the Laguna channel deposits its coarser sediments in the southern study area near the upper limit of the annual floodplain. The surfaces of these soils show recent deposition or scouring from alluvial processes.

Wright Loam. This soil occurs along the eastern and southern perimeter of the study area. It is derived from Pleistocene alluvium and has formed a clay subsoil (hardpan) as a result of weathering processes. The topography where this soil occurs is referred to as "hummocky," which means the surface is a gently undulating mosaic of mounds and depressions. The depressions are typically small, closed basins which pond water because of the impermeable clay subsoils. Areas of ponded water are referred to as vernal pools.

HYDROLOGY

Surface Water

The Laguna de Santa Rosa is a perennial stream that extends about 4miles southeast of Sebastopol to about half a mile east of Trenton at the western edge of the Santa Rosa Valley. It is a major tributary to the lower Russian River. The waterway is characterized by very low gradient, slow velocity flows and extensive wetlands.

Tributaries. Within the study area, the Laguna de Santa Rosa gathers runoff from the Santa Rosa Plains and the small drainage of the Sonoma Mountains to the east and the Merced Hills to the West. Major tributaries downstream of the study area include Blucher Creek, Roseland Creek, Colgan Creek, Hinebaugh Creek, Crane Creek, and Copeland Creek. Within the study area tributaries include Gravenstein Creek, Windmill Creek, Calder Creek and Zimpher Creek.

Flooding. The 100 year floodplain in the study area is at the 76 foot contour. However, the most ecologically significant floodplain is the annual floodplain. The annual floodplain in the study area is at the 56 foot contour, which straddles the Laguna

channel in the northern half of the study area. Riparian forest and marsh in the Laguna require a hydrologic regime of regular flooding, so their distribution approximates the extent of the annual floodplain.

Urban Stormwater. Recent land use changes in the Santa Rosa Valley have caused several changes to the hydrology of the Laguna de Santa Rosa. Urban growth in Santa Rosa and Rohnert Park has greatly increased the amount of impermeable surface in the watershed. This Decrease in the amount of permeable surface has reduced the infiltration of rainfall and causes an increase in flood stage (depth of floodwater) while shortening the amount of time for flood flows to reach their peak.

Ground Water

Much of the perennial flow added to the Laguna originates as seeps and springs in the Blucher formation of the Goldridge Hills west of the study area. It is possible that groundwater discharge to the Laguna has decreased, because of increases in the impervious surface of the watershed (Waaland, 1989). Irrigation has supplemented groundwater discharge to the Laguna to an unknown degree. Groundwater availability would be considerable under all soils of the study area except the Wright loams.

Water Quality

The term "water quality" encompasses a number of chemical and physical attributes that determine the suitability of aquatic habitat to aquatic organisms. Each aquatic species has tolerance limits for water quality parameters. For example, nursery habitat of many salmonid fish (such as trout and salmon) is limited by dissolved oxygen and water temperature, which generally need to be greater than 5 mg/L and less than 18°C, respectively (Reiser and Bjorn, 1979; Waaland et al, 1990). Water quality also affects the aesthetic quality of the Laguna. For example, suspended algae and inorganic material (e.g., clay and silt) cause turbidity, which many people find unattractive.

For the purposes of this discussion, the Laguna has been divided into an "upper" reach, ~~down~~stream of the confluence with Santa Rosa Creek and a "lower" reach, down stream of the confluence with Santa Rosa Creek. Historically, the minimally treated wastewater from Santa Rosa entered the upper reach of the Laguna via West College Treatment Plant dischareges to Santa Rosa Creek (Dodds, 1976; Waaland, 1990). More recently, discharge occurs at two primary points, the newer treatment plant at Lllano Road inthe lower Laguna, and Delta Pond, in the upper Laguna .

Laguna water quality is affected by several factors, including:

- The flow and quality of tributary streams.
- Discharges to the Laguna, such as farm runoff containing animal waste, reclaimed water, and urban storm runoff.
- Internal processes such as erosion, sedimentation, aeration, and algal growth.

Historic Conditions

The history of recent water quality conditions in the Laguna can be divided into two periods, before and after about 1969. Laguna water quality data collected between 1969 and 1985 were evaluated by CH2M Hill (1989). Nitrate levels have declined, and average and minimum dissolved oxygen levels have increased in the upper Laguna between 1973 and 1985. Water quality changes in the lower Laguna, including the Laguna MAster Plan study area, were less pronounced. Chlorophyll in the Laguna was observed as high as 2,200 _g/L during the 1970's; the highest value observed during the 1980's is 170 _g/L. The improvement in Laguna water quality probably is a result of improved treatment of wastewater by the Santa Rosa Subregional Wastewater Treatment System. No water quality data are known to have been collected prior to 1969.

Current Water Quality Conditions

The following discussion is based on water quality data collected from 1985 through 1988 by the Regional Water Quality Control Board, and summarized in CH2M Hill (1989). The Laguna is a naturally eutrophic (biologically productive) waterway that has been affected by long-term changes to the watershed. The slope of the Laguna is very gentle, resulting in a very low velocity of flow. Low flow velocity causes suspended material to settle in the

Laguna. Nutrient-laden organic material enters the Laguna from tributaries and adjacent lands during winter runoff events, and is incorporated into Laguna sediments.

The effect of this wintertime load of nutrients and organic material on water quality is shown in **Table 1.** The nutrient load affects ammonia and nitrate levels in winter, when insufficient light is available for algae to grow and consume the nutrients. In spring and summer, the decay of organic matter consumes dissolved oxygen, and nutrients stimulate algal growth. Algae produce dissolved oxygen during the day and consume it at night. When excessive algal growth occurs, so much oxygen is consumed at night that the level of dissolved oxygen in the water may drop to zero, a stressful or fatal condition for many, but not all, aquatic animals (some fish and invertebrates can gulp air or crawl out of the water when dissolved oxygen is too low; others, such as trout, die).

Table I Laguna Water Quality: 1985-1988 Seasonal Averages (Source: CH2M Hill, 1989).

Location	Season	Ammonia (mg-N/L)[1]	Un-ionized Ammonia	Nitrate (mg-N/L)	Dissolved Oxygen (mg/L)	Chloro-phyll
Upper Laguna[3]	spring	1.093	0.0254	1.075	13.13	no data
	summer	0.110	0.0240	*	16.50	232.0
	fall	0.120	0.0150	0.362	8.34	673.3
	winter	5.225	0.0127	1.175	3.65	3.4
Lower Laguna[4]	spring	1.226	0.0144	0.884	6.70	59.6
	summer	0.042	0.0008	0.044	6.52	84.8
	fall	0.069	0.0009	0.046	7.60	10.8
	winter	2.073	0.0080	1.095	6.83	3.5

1: mg-N/L = millegrams of nitrogen/liter; 2: = microgram; 3: upper = downstream of confluence with Santa Rosa Creek; 4: lower = upstream of confluence with Santa Rosa Creek (includes Laguna Master Plan study area)

Dissolved Oxygen

CH2M Hill (1989) reported that the concentration of dissolved oxygen in the Laguna above the confluence with Santa Rosa Creek was less than 5 mg/L in 36 percent of all observations, and less than 5 mg/L in 15 percent of all observations made below Santa Rosa Creek, which includes the Laguna Master Plan study area. By contrast, the concentration of dissolved oxygen in Mark West Creek and Santa Rosa Creek is generally greater than 5 mg/L. Dissolved oxygen levels in the study area appear adequate for the surival and reproduction of salmonids because the recommended minimum of 5 mg/L DO is mostly exceeded

Ammonia

The average wintertime concentration of total ammonia in the upper Laguna is about 5 mg-N/L, while the average concentration of the un-ionized fraction of total ammonia is about 0.22 mg-N/L. The concentration of total ammonia declines substantially in spring and summer throughout the Laguna. However, pH and temperature conditions cause the ammonia to exist primarily in the un-ionized form at concentrations ranging upward from 0.015 mg-N/L throughout the year in the upper Laguna, and in spring in the lower Laguna. The un-ionized form of ammonia is toxic to many aquatic species, and 0.015 mg-N/L exceeds the EPA Water Quality Criteria for Protection of Aquatic Life.

The source of this ammonia is not known, but CH2M Hill (1989) estimated that about 80 percent of the ammonia is derived from nonpoint pollution sources, such as street and farm runoff. The Regional Water Quality Control Board has begun to evaluate nonpoint sources of pollution in the Laguna.

Chlorophyll

Chlorophyll is the primary photosynthetic pigment in most algae, and chlorophyll concentration is an indicator of algal productivity. The chlorophyll concentration throughout the Laguna tends to peak each year in late spring. Chlorophyll in tributary streams ranges from 1 to 5 _g/L, and up to 170 _g/L in the Laguna. High chlorophyll values (greater than 50 _g/L) have been observed throughout the Laguna. CH2M Hill (1989) concluded that nitrogen generally limits algal growth in the Laguna. The low

flow velocity and high nutrient inputs (primarily from nonpoint sources) combine to create conditions that promote algal growth.

The presence of gravel combined with high water clarity in the tributary streams promotes growth of attached algae. For instance, in springtime, long strands of filamentous algae can be seen in Mark West and Santa Rosa Creeks. The relatively high turbidity (which limits light penetration) and fine particle size of benthic sediments in the Laguna tends to prevent growth of attached algae.

Conclusion Regarding Water Quality for the Study Area.

Within the study area, the levels of un-ionized ammonia may reach deleterios levels in the spring. It is likely this ammonia increase arises comes from non-point sources, because wastewater discharge is primarily inthe upper Laguna. With respect to dissolved oxygen in the study area, conditions appear adequate for salmonids.

ECOLOGY

Plant Communities and Wildlife Habitat Relationships

Prior to the arrival of the white man, the Laguna region was occupied by three different Native American communities: 1) the Kohnomtara, claiming the Sebastopol side of the Laguna, 2) the Bitakcomtara, claiming the Santa Rosa side, and 3) the Ketaictemi, which claimed some of the Laguna near Mark West Creek (Fredrickson and Markwyn, 1990). These groups were politically autonomous, but spoke dialects of the Southern Pomo language. These groups kept no written records, but early accounts were recorded by the non-indigenous settlers.

In 1850, wildlife and waterfowl were abundant in the Laguna. The ecosystem was ". . . studded with groups of oaks and flowering evergreens . . . . herds of deer . . . and here and there a drove of elk or antelope....[M]arsh full of wild fowl . . . . wooded plain with grasses as tall as ourselves . . . abounded with deer, elk and antelope . . . . shot all that came in our way . . . . native horses . . . . much wild duck . . . (Marryat, 1977). Included in this scene were the grizzly bears, which feasted on the silver salmon and steelhead migrating to spawning gravels throughout the Mark West Creek, Santa Rosa Creek and Laguna de Santa Rosa watersheds.

One of the most dominant aspects of the early Laguna environment was oak woodland vegetation. Marryat, from a high spot on the west side of the valley, reported a "thickly wooded plain extended for miles - on one side bounded by mountains, on the other . . . the winding Russian River." In 1859, another traveller, Bayard Taylor, reported: "As we got out of the shabby little village of Santa Rosa, I perceived we were already in the Russian River Valley. Its glorious alluvial level, sprinkled with groves of noble trees, extended far and wide before us . . . The greater part of the land was evidently claimed and the series of fenced and cultivated fields on either side of the road was almost uninterrupted. It was melancholy to see how wantonly the most beautiful trees in the world had been destroyed; for the world has never seen oaks as grow in the Russian River Valley. The fields of girdled and blackened skeletons seemed doubly hideous by contrast with the glory of the surviving trees." Evidence of the extent of oak tree loss from the Laguna environs can be seen in typical railroad shipment data from the little village of Fulton in 1878:

9000 cords firewood
1000 cords tanbark (oak used in tanning leather)
150 railroad carloads of charcoal. (Dodds 1976)

From these early accounts, it is clear that the Santa Rosa Plain and Laguna were much wilder in the past, but the land was already subject to human induced modification. In fact, the local Native Americans Indian communities had a large effect on the landscape through the practice of burning: "The rainy season was approaching and the heat became occasionally intense. At times, the Indians would fire the surrounding plains, the long oat-straw of which would ignite for miles. The flames would advance with great rapidity, leaving everything behind them black and charred . . . . The Digger Indians burn the grass to enable them to get at roots and wasp nests; the young wasps being a luxury with them. (Marryat 1977).

Soon after the arrival of whites, the Laguna provided much of the food supply for "Gold Rush" San Francisco: "The wild fowl came over in heavy flight and settled in our vicinity. The geese were in incredible numbers; white and grey geese and brandts. Of ducks we had several varieties, and I regret that I failed, from want of materials, in my endeavors to preserve specimens of them. The geese are very easily shot when they arrive, soon became very wary....Herons and curlew were plentiful, and very tender, jack-snipe in great abundance, but I never disturbed them, for I am a bad snipe shot, and the first rule in the mountains is to spare your powder (Marryat, 1977)." One market hunter bagged 6,200 ducks in 1892 (LeBaron 1987). As reported by Dodds (1976): "Deer and antelope brought twenty dollars each delivered to the waiting boats on the headwaters of Petaluma Creek. The hind quarters of a fat elk was worth $40, and even quail sold for $9 a dozen. Ducks were worth a dollar each and bear meat jerked or fresh was a staple in the gold rush diet. Some elk and grizzlies could be found far back in the hills of the county until the 1870's, but the valley populations were quickly exterminated."
The combined effect of the market hunters had decimated waterfowl to such a degree by 1897 that a local gun club prevailed on the Board of Supervisors to outlaw commercial hunting (LeBaron 1987). But by this time the composition and diversity of the Laguna ecosystem had diminished greatly in feeding the rapid development of the Golden State.

A systematic drainage of the Laguna wetlands began around the turn of the century. The earliest maps of the Laguna channel show a broad waterway (Waaland, 1990). Three lakes along the Laguna's length, one at the south end near Cunningham, one just east and north of Sebastopol, and one, referred to as Ballard Lake, between River and Occidental Roads. A 1915 map (Watson et al, 1917) illustrates areas north of Sebastopol considered to be swamp and marsh. These wetlands conservatively totalled approximately 1,400 acres. North of the study area, in the "upper Laguna" reach, Ballard Lake provided fishing, boating and swimming. Even portions of the "lower Laguna" on the edge of Sebastopol were documented with postcards as a prime recreation water body. For a variety of reasons, including mosquito problems, the desire to create more land suitable for farming, and a concern about the flooding of Sebastopol, Mr. Denner, a local rancher and Mr. Doyle of Santa Rosa decided to dynamite an outlet, causing the lake to drain. Mr. Doyle owned land in northeast Sebastopol that fronted the Laguna, lending credence to the idea that an extensive wetland adjacent to the town persisted into summer.

In 1945, a U.S. Fish and Wildlife Service biologist surveyed the Laguna (McBride 1945, in Cardwell 1958), and reported that "at times, the Laguna area is one continuous body of water as much as 10 miles in length and ranging in width from a few hundred feet to as much as 1.5 miles locally." He goes on to state that "[e]vapotranspiration occurs on a large scale along the Laguna de Santa Rosa at the western side of Santa Rosa Valley in a swampy area that varies in size with seasonal rainfall conditions but averages about 1,000 acres during the summer." By this time, at least 500 acres of riparian forest had already been cleared (Waaland 1989) by local farmers wishing to increase cultivated acreage along the boundaries of the Laguna floodplain.

Most of the recent clearance of the Laguna channel was a direct result of a channelization project undertaken in 1966, which the Sonoma County Water Agency (SCWA) implemented for agricultural drainage purposes (SCWA 1960). The Water Agency undertook the project at the urging of local farmers (de Mars et al. 1977). Eight miles of pilot channel with a 100 foot right-of-way was excavated from Occidental Road to one mile north of Guerneville Road. From this point to River Road, the Laguna was channelized by the efforts of local farmers. Only 272 acres of the original riparian forest in this area exists today (Waaland, 1989).

Table 2 shows the loss of habitats at the regional scale of the greater Laguna ecosystem (Waaland et al, 1990). Fortunately, there are still significant remnants of the original riparian forest, freshwater marsh and oak woodland/vernal pool complex.

Table 2

Loss of original habitats at the regional scale of the greater Laguna de Santa Rosa ecosystem. Current acreage of oak woodland/vernal pool complex is only for unirrigated areas because irrigated oak savanna is dissimilar in many respects. (Source: Waaland et al, 1990).

Habitat Type	Historic Acreage	Current Acreage	Percent Loss
Oak woodland/vernal pool complex	20,200	1,300	94%
Freshwater marsh[1]	4,400	1,900	57%
Riparian forest	3,400	450	92%
Total	**28,000**	**3,650**	**87%**

[1] Current acreage of freshwater marsh is estimated at 150 of permanent wetland and 1,750 acres of seasonal wetland.

Plant Communities and Wildlife Habitat Relationships. The terrestrial and aquatic communities of the site have been classified into habitats which correspond as closely as possible to those described in the Wildlife Habitat Relationship System (Mayer and Laudenslayer, 1988), but have been modified to better reflect local ecology. The distribution of plant communities is shown in Figure 1. The flora observed in the various communities during the field surveys are listed in Appendix 1. Wildlife descriptions for each plant community rely on recognized wildlife habitat relationships (Mayer and Laudenslayer, 1988) and previous studies in the area (Waaland et al, 1990). Wildlfie observed at the "railroad forest," and nearby areas (i.e. Kelly Farm and Brown Farm) are listed in Appendix 2. Bolander has also provided a complete list of birds using the Laguna area (de Mars, et al, 1977).

Riparian Forest. The riparian forest occurs centrally in the study area, comprised of the "railroad forest" between Highway 12 and the area arounfd the railroad bridge, and the Barlow forest along the Laguna north of Highway 12. The most frequently occurring tree species are the willows, Oregon ash, valley oak, box elder and occasionally walnut and cottonwood. Appendix 1 lists the flora observed during field surveys.

Stand: structure is related to the age of the stand and the species variety. The railroad forest stand is relatively old and undisturbed for 30-40 years so it exhibits a complex structure (Appleton, 1989). There is an almost impenetrable understory of rose, blackberry, poison oak, around the edges (ecotone) of this habitat, but it thins out in the interior and is joined by snowberry and grasses. The lower canopy is willow and ash, with an open overstory of scattered remnant valley oak. The average tree density is greater than 90 trees per acre for trees of diameters from 8 to 14 inches DBH.

Wildlife:. Riparian wildlife surveys were concentrated in two of the major remaining riparian stands, one near Sebastopol adjacent to the old railroad bed, and the other between Delta Pond and the Laguna channel. Appendix 2 lists the twenty-one species of birds observed in the "Railroad forest" in three days of surveys in June 1989 (Waaland et al, 1990). This summer survey is only a partial assessment of overall use, excluding many of the seasonal migrating species, but reflective of the summer and yearlong residents. Birds of special interest observed in the "railroad forest" are great blue heron, great egret and yellow warbler. Other birds of special interest observed in other Laguna riparian areas include snowy egret, black-crowned night heron, and osprey. Mammals observed directly or indirectly (scat, tracks, burrows, etc.) in the "railroad forest" riparian area include black-tailed hare, raccoon, black-tailed deer, coyote or domestic dog, southwestern pocket gopher. Although few reptiles or amphibians (garter snake, western fence lizard, slender salamander, and Pacific tree frog) have been observed in riparian areas of the Laguna, at least 8-10 species are assumed to reside in this habitat.

Freshwater Marsh. The perennial marshes occur in the shifting sediments all along the Laguna channel, but especially in the southern portion of the study area and more extensively just upstream on the CDFG Carinialli preserve. The dominant species are emergents such as tules cattail, bureed, water plantain and swamp smartweed.

Wildlife surveys were conducted in emergent wetland areas just upstream of the study area at Alpha Farm and downstream at Kelly Farm. Thirty-three bird species were observed, of which 6 (great

blue heron, great egret, snowy egret, black-crowned night heron, osprey, and California gull) are of special interest. Ten species of mammals were observed, directly or indirectly, in these areas: raccoon, river otter, striped skunk, house cat, black-tailed deer, black- tailed hare, western harvest mouse, deer mouse, house mouse and ornate shrew. Western pond turtles, Pacific tree frogs, and bullfrogs were observed in perennial wetlands. Many birds and mammals that roost, nest, or shelter in riparian areas hunt for food in nearby emergent areas. Examples are herons and egrets, osprey, wood ducks, raccoons, opossums, skunks, mink, and river otters.

Riverine. This aquatic habitat occurs within the Laguna channel as it passes through the riparian woodland and freshwater marsh. A detatiled discussion of this habitat is provided in the fishery resources section and Appendix 3. The riverine habitat can provide prey for osprey, but belted kingfisher, waterfowl, herons and shorebirds are more commonly found utilizing food resources. Insectivorous birds, such as swallows, swifts and flycatchers, hawk their prey over the open water. Mammals found in riverine habitat include river otter and mink. Western pond turtles, garter snakes, bullfrogs and pacific treefrogs also inhabit the creek.

Seasonal Wetlands. Seasonal wetlands are extensive in the study area, occurring in floodplain adjacent to the Laguna channel and in low areas of the Barlow field. In contrast, to the flora of perennial freshwater marshes, the flora of seasonal wetlands are made up of plants that tolerate long-duration saturated soils, but don't require a perennial source of moisture. The most common species were Italian ryegrass and curly dock. However, the vegetation of irrigated and grazed seasonal wetlands, as occurs on the Barlow filed, is distinct because the perennial moisture irrigation, combined with heavy grazing pressure, results in a vegetation that is largely made up of noxious weeds such as cocklebur and Spanish thistle. Other weeds include fog-fruit and salt bush. Other seasonal wetlands west of the Laguna that were grazed or cultivated in the past have a different compliment of weed species, such as beggar-ticks. Some of the present seasonal wetland area was riparian forest or perennial marsh in the past. These lands have been cleared and drained to facilitate agricultural uses.

Tree frogs, toads, and various salamanders may breed in seasonal wetlands (as well as vernal pools) during the wet season. During the dry season, the same areas may be used by black-tailed hares, cottontail rabbits, terrestrial snakes and lizards, etc.

Oak Woodland. The oak woodland can appear savanna-like with solitary oaks amidst and vernal pools, or can achieve greater densities and include a shrub layer. The oak woodland occurs primarily on the Wright loam soils. Most of the oak woodland occurs on the Barlow field where it has degenerated from excessive irrigation of effluent. There is no subcanopy or shrub strata present in this phase of the oak woodland. The herb layer plants closely resemble those of the irrigated pasture.

The oak woodland is a residual of old valley oak trees dispersed in clumps usually of 10-20 acres in size. These stands are relictual because most of the trees are over 140 years of age and their is virtually no regeneration. The lack of young replacement trees may be due to the fact that cultivation and grazing of the Laguna ecosystem began in earnest about 150 years ago during the Gold Rush era. Trees are generally 30-40 inches in diameter at breast height (DBH), averageing 1.5-2 trees per acre (Appleton, 1989). Between 1942 and 1988, 9-15 % of the oaks have been lost on lands adjacent to the study area (Brown Farm and Alpha Farm). Since 1977, when the Subregional System began wastewater irrigation, the average annual rate of loss doubled from 0.8 trees per year to 1.5 trees per year (Appleton, 1989, Waaland et al, 1990). During this time, no trees have been lost at the Todd Road Preserve. The losses have been attributed to trenching activities and root rot fungus resulting from prolonged saturation op the soils.

Wildlife surveys were conducted onsite at Brown Farm the adjacent Kelly Farm (Appendix 2). A total of 49 species of birds were observed in the Laguna area (Waaland et al, 1990). Birds of special interest included great blue heron, great egret, black-crowned night heron, black-shouldered kite, osprey, and yellow warbler. Eight mammal species were observed: raccoon, California vole, southwestern pocket gopher, black-tailed hare,

black-tailed deer, dog or coyote, striped skunk, and cottontail. Like the Barlow field, most of the oak woodland areas on Kelly and Brown Farms were irrigated and either mowed or grazed, activities which tend to make them unattractive to many mammals (as well as to many reptiles and amphibians) and also tend to obliterate signs of wildlife activity. Some areas are irrigated so heavily that the soil is constantly wet, rendering it unsuitable for burrowing animals.

Vernal Pools. Vernal pool in the study area are located in annual grassland and in swales adjacent to the Laguna channel. Several large vernal pools occur adjacent to the south boundary of the study area. Plants range in their dependance on saturated soil conditions from the common, facultative Italian ryegrass to characteristic vernal pool obligate plants such as spiked rush, California semaphore grass, coyote thistle and smooth goldfields. Several populations of the State and Federally listed endangered Burke's goldfields and Sebastopol meadowfom occur inthe study area. These species occur as well the adjacent CDFG Carinalli preserve just south of the study area.

Wildlfie observations of vernal pools in the Laguna were made in the dry season (Waaland, 1990), so no indications of how they may be used during the wet season were obtained. They are probably used, when ponded, by many animals for drinking water, by migratory waterfowl for resting and feeding, and for breeding by amphibians such as tree frogs, western toads, and salamanders. During the dry season, the same areas may be used by black-tailed hares, cottontail rabbits, terrestrial snakes and lizards.

Annual Grassland. This habitat is found in filled areas between the Laguna and the "cross-ponds" on Brown Farm and upland areas west of the Laguna channel. The grassland forms a dense cover of annual grasses up to three feet in height. The annual grassland vegetation is composed mostly of introduced grasses and weedy herb species. The most common dominants are all introduced annual grasses: soft chess, foxtail fescue, Italian rye grass, rip-gut brome and slender oat. Introduced forbs, such as cut-leaf geranium, smooth owl's clover, spring vetch, hairy cat's ear and prickly lettuce are also abundant. In the fall, tarweeds remain the only green plants in the vegetation. Associated with the introduced species are residual elements of the original bunchgrass vegetation; mostly numerous species of showy-flowered, native wildflowers. Occasionally, stands of native bunchgrass, such as California oat grass and needle-and-thread grass are encountered. Most of the annual grassland sites would probably have been classified as oak woodland in the past, but over time, grazing and the lack of oak regeneration have resulted in the virtual absence of a tree layer.

Annual grasslands are favored by certain birds such as northern harrier, western meadowlark, and pheasant, and by some small mammals, mainly rodents, that prefer the greater ground cover afforded. However, the lack of trees and downed wood for nesting and shelter limits use of these areas by many birds, mammals, reptiles and amphibians. The various phases of pasture (irrigated hayfield, irrigated seasonal wetland/vernal pools) described below are less attractive to most species than are annual grasslands. The same open-area birds (pheasant, northern harrier, western meadowlark) that use annual grasslands may use these areas, as may some "pest" species, such as house mouse, southwestern pocket gopher, and California vole. The annual grassland may be used by black- tailed hares, cottontail rabbits, terrestrial snakes and lizards.

Irrigated Pasture. This habitat type is located on the Brown Farm portion of the study area, east of the Laguna channel. It is composed mostly of grasses from two to four feet in height, but can achieve heights over six feet before the first mowing for hay. Another phase of the irrigated pasture habitat falls under the category of irrigated seasonal wetlands. These are sites which were historically wetlands, but have been modified for use as pasture. Much of this area was likley oak woodland or seasonal wetland inthe past.

Pasture can support many of the wildlife species found in surrounding habitats so long as habitat conditions are not too altered. Ground-nesting birds like pheasant, and some waterfowl can nest in pastures if enough residual vegetation is present at the onset of the nesting season. Raptors hunt for small mammals living in the lush grass. Deer will utilize browse available in the

pastures. Shorebirds like great blue heron and egrets will hunt for amphibians in wet areas and small mammals.

Man-made Water Flow (Drainage Ditches). Most of the irrigated areas in the study area have had "man-made drainageways" (Figure 1) channelized for mosquito abatement to facilitate movement of water and provide mosquito-fish habitat. The channel bottoms often resemble small, linear marshes dominated by water plantain, nut-sedge and brooklime. Over time the natural process of plant succession results in cattails and bulrush becoming dominant. These plants form dense stands which are periodically dredged out of the channel and placed on adjacent spoil banks. This disturbed soil provides habitat for many noxious weed species such as thistles and cockleburs. This management strategy presents a series of ongoing disturbances because trees are not allowed to grow and shade out the problematic emergent vegetation.

Urban. This habitat occurs on the western edge of the study area. Included in this category are rural residences, subdivisions, ranchettes or businesses clustered at densities approximating one unit per five acres or less. Also included in the urban habitat are city parks. The structure of urban vegetation varies. Shade trees and lawn are probably most common in the rural residential setting. Shrubs are often planted ornamentally around structures.

Urban areas in the Laguna area are mainly used by highly adaptable wildlife such as skunks, raccoons, rats, and house mice, animals which may find shelter under houses, in attics or walls. These mammals become pests through raiding garbage, competing for food with domestic pets, eating garden crops or flowers, or causing structural damage to buildings. Others (bats, for example) may roost in buildings but are otherwise unnoticed. Many songbirds nest, shelter, and forage in trees, shrubs, or structures, as do others considered pests (pigeons, starlings). Reptiles and amphibians are generally scarce in urban areas, probably owing in part to harassment and/or predation by domestic pets and humans.

Ponds. These lacustrine habitats are mostly holding ponds for reclaimed water used for irrigation of pastures. The cross-pond on Brown Farm on the east side of the study area is the largest. Deep, still water portions of the Laguna channel (i.e. "lentic") are considered ponds also. These ponds can provide feeding and loafing habitat for waterfowl and shorebirds.

Fishery Resources

This section draws heavily from the previous studies, especially the work of Jennifer Neilson (CH2M Hill, 1989; Waaland et al, 1990). A description of terms and detailed explanation of habitat types, cover, substrate and diversity of the study area is provided in Appendix 3.

Aquatic Habitat

Aquatic haibats within and adjacent to the study area are dominated by lentic pools, relatively deep slackwater areas (Appendix 3). However, upstream, near Todd Road, the Laguna exhibits more riffles and glides. In general, riffle substrate of the Laguna has higher proportions of sand and mud and lesser amounts of gravel and cobbles compared to its tributaries. The habitat diversity, a measure of the potneital abundance and variety of fish, is low in the study area, but very high upstream near Todd Road. Pool/riffle ratios, another measure of potential fish abundance and variety, were also low in the study area but higher just upstream.

Fish of the Laguna

Appendix 3 lists the fish species known to occur in the Laguna ecosystem. Since most of the fish captured in surveys of the Laguna are nonanadromous (i.e., they do not migrate between freshwater streams and the sea), it can be inferred that a similar assemblage would occur within the creeks of the study area. The one notable exception is fish of the Salmonidae family (rainbow trout and steelhead trout). These fish are known to travel long distances upstream to spawn in the winter, and move within the drainage as juveniles to overwinter in lentic pool habitat, such as that found in the Laguna. Sampling of the population during the winter would be necessary to establish the extent of winter habitat use by this species in the Laguna. Steelhead juveniles have been observed in the study area during the summer (Cox, personal communication).

The majority of the Laguna fish assemblage are warm water species that are known to frequent deep, eutrophic, slack water

habitats or sloughs, while their young rear in shallow waters with emergent vegetation. These fish would do well in low gradient thalweg pools and lentic habitats, which dominate the reaches of the study area. The reproductive patterns and typical benthic food resources of warm water fishes are compatible with the cover and substrata available on these habitats. The perimeters of deep impoundments and wetland areas, also found at these sites, provide excellent juvenile rearing habitat for these species. Juvenile warm water fishes have been observed rearing in lentic wetlands near Highway 12 in the study area.

The warm water assemblage found on the Laguna represents a "typical" assemblage for Northern California rivers. All of the warm water species found in the Laguna de Santa Rosa are known to occur in the Russian River drainage (McGinnis 1984), and may move in and out of the Laguna searching for food and reproduction sites. It should be noted that the three most abundant species (Sacramento blackfish, carp and green sunfish) are known to be tolerant of low oxygen levels, high temperatures, and to some extent high alkalinity -- water quality parameters similar to those in the Laguna. This flexibility would make them well-adapted to slack water areas with limited replenishing flows during the summer. These fish (all introduced species) are also fierce competitors for food and space in the aquatic ecosystem. If summer flows were to increase through the existing habitats, it would probably result in an expansion of the existing populations rather than a change in the fish assemblage.

California roach, prickly sculpin, threespine stickleback, and steelhead (rainbow) trout are known to inhabit cool freshwater streams in California (Moyle 1976). The habitat assemblage on second and third order streams during the fall and early winter is similar to those found just upstream of the study area near Todd Road (J.L. Nielsen, unpublished data, 1989), with the exception of riffle abundance. Lateral scour pools, especially those formed around large organic debris and rootwads, are known to be preferred habitat for salmonid juveniles. Backwater eddies associated with rootwads and secondary channels are used by juvenile salmon and trout as overwintering habitat (J.L. Nielsen, unpublished data). An increase in the abundance of riffles and backwater habitat in the study area would increase the potential for salmonid fish production.

Riffles are known to be important to freshwater stream fishes for three reasons. They are the site of significant secondary production in the form of aquatic invertebrates, and are an influential link in the food chain for many stream fishes. They are important factors in the mixing and oxygenation of the stream waters. Recent research also indicates the role of riffles in the cooling of stream flows by increasing interstitial water flow, in which solar heat is exchanged with cool substrate materials (Ozaki 1988). The amount of riffle habitat in the study area is low, but increases significantly upstream in Todd Road reaches.

A number of juvenile steelhead have been observed using the Laguna in the Study area as rearing habitat (Bill Cox, personal communication). Salmonids are sensitive to high summer rearing temperatures. Parts of the Laguna dry to intermittent pools during the summer. If pool temperatures exceed 22oC in these summer habitats, salmonids will cease feeding and growth rates will decline. The probability of disease and death increase as fish condition gradually declines. Riparian vegetation along stream reaches used for rearing has been shown to reduce summer stream temperatures by 4-7oC. The riparian vegetation in the study area is critical to the salmonids known to be using the Laguna as rearing habitat.

The habitat distribution at Todd Road reflects higher pool to riffle ratios than the rest of the Laguna. If habitat is limiting in the Laguna, it is likely that riffle habitat is most limiting to stream fishes. It also may be the case that natural steelhead runs have declined to such an extent that the habitat is no longer limiting for the low numbers of remaining steelhead. Other factors, such as spawning gravels and water quality, may limit the salmonid distribution and production. Lack of rock cover may contribute to the low numbers of stream fishes in the Laguna system. California roach, sculpin and trout juveniles are known to frequently use rock cover for protection from predators, as overwintering habitat, and as daytime lairs from which to ambush prey. The limited rock cover available in the stream reaches of the

study area probably contributes to the low occurrence of these species.

HABITATS AND SPECIES OF CONCERN

CDFG Habitats of Concern. The California Department of Fish and Game (CDFG) has identified native habitats throughout the state that are rare and/or undergoing serious decline (Holland, 1986; Airola and Messick, 1987). While these habitats have no legal status per se, they represent biological resources that are unique to California. The vernal marshes at the site, although artificial, would likely be considered a CDFG habitat of concern in the project region. Plant species of concern, like Burke's goldfields, or Bogg's Lake hedge hyssop, could occur here. The pools formed in the vernal marsh provide habitat for migratory waterfowl and shorebirds.

Other Sensitive Habitats. Other habitats present in the study area are sensitive because they provide critical habitat for sensitive species, function as "keystone communities" which provide an integrative link amongst all habitats in an area, or are declining on a local or regional scale. These habitats include wetlands (i.e. vernal marsh, freshwater marsh, riparian woodland) and oak woodland.

Wetlands. The freshwater marsh, vernal marsh and riparian woodland are significant biological resources and are potential jurisdictional wetlands. Fill and destruction of these habitats may require permits and agreements from the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act and streambed alteration agreements from CDFG.

Freshwater Marsh. This habitat has declined precipitously in California, supports numerous wetland dependent species, and has a high integrative value for species in adjacent habitats.

Riparian Woodland. This community probably has the highest biodiversity of all communities at the site. It provides a "keystone" function integrating all habitats at the site, and may support several sensitive animal species. Numerous special habitat elements are found in this community.

Oak Woodland. This habitat is declining statewide and regionally (Bolsinger, 1988). The oak trees could provide nesting and roosting sites for bird species of concern such as long-eared owls, sharp-shinned hawks and Cooper's hawks. Migratory passerine birds utilize woodland for resting and feeding sites. Numerous special habitat elements are found in this community.

Special Habitat Elements. Special habitat elements provide a limited niche or breeding resource, are integral components in habitat diversity, or serve as an important food resource. Examples include: tree/grassland edge, tree or shrub/water edge, burrows, shrub layer, tree layer, logs, slash, stumps, snags, vernal pools, hardwood trees, riparian inclusion and acorns. All of these elements are present at the site, mostly in the woodland habitats.

Species of Concern

Reports produced by the California Natural Diversity Data Base (1985, 1988), and previous studies addressing the ecology in the project region (EIP, 1990; LSA 1991, Waaland et al, 1990) indicate that sixteen plant species of concern and forty animal species of concern have the potential to utilize habitats in or near the project vicinity.

Plants. Appendix 1 lists the plant species known to occur in the project region. Of these, Sebastopol meadowfoam and Burke's goldfields occur in the study area. Sonoma sunshine occurs in adjacent lands. It may be possible to reintroduce plant species associated with vernal pools or marsh into suitable existing or restored habitat.

Animals. Appendix 3 lists the animal species known from the project region or with the potential to occur there. Of those listed, a number have been reported from the Laguna de Santa Rosa. The western pond turtle has been observed in the project area. Great blue heron, great egret and snowy egret, special animals without official status, are commonly seen hunting the banks of the Laguna and its tributaries and marshes. California tiger salamander and linderiella may utilize seasonal wetlands and vernal pools in the study area. The oak woodland could provide nesting and roosting sites for bird species of concern such as long-

eared owls, sharp-shinned hawks and Cooper's hawks. The valley oak ant and ancient ant may be found on trees in the woodlands. Badger are known from uplands in the region (Buckmann, personal communication) and may occur in the grasslands in the study area.

The original description of the freshwater shrimp was from the Laguna although it has not been sited for years. The California yellow-billed cuckoo once occurred in the Laguna also, but nests there no longer. Both of these species could be reintroduced into a restored Laguna ecosystem, and possibly within the study area.

ARCHAEOLOGICAL RESOURCES

A record and literature review of existing archaeological information on the study area was performed by the Northwest Information Center, Department of Anthropology, Sonoma State University, a branch of the California Archaeological Inventory (CAI). The CAI determined that the study area contains five recorded prehistoric archaeological sites listed with the California Archaeological Inventory. State and federal inventories list no historic properties within the study area.

Approximately 30 % of the study area has been archaeologically surveyed.

The study area is situated in an area of high archaeological sensitivity. Five prehistoric sites, ranging from lithic scatters to habitation sites, have been recorded within the study area. Two sites including what may be the ethnographic village site of Batinklehcawi, are adjacent to the project area; 13 additional sites are within a 1/2-mile radius of the study area.

A map has been prepared delineating the areas which contain recorded archaeological sites. The map also delineates areas which have not yet been surveyed. Due to the sensitive nature of these sites this map is considered confidential and therefore it is not included in this report. The map has been provided to the City planning staff for their use in implementing the master plan.

CAI recommends the following with regard to archaeological resources within the study area.

1. Further archival and field study is recommended for unsurveyed portions of the study area.

2. A qualified archaeologist should be retained to evaluate specific project impacts to archaeological sites within the study area, and provide appropriate recommendations.

3. Construction or earth-disturbing activities occuring within the area of existing archaeological resources should be conducted following the recommendations provided by the archaeologist.

The office of Historic Preservation has determined that buildings and structures 45 years or older may be of historic value. Any such structures within the study area should be evaluated prior to detail design and implementation.

If cultural resources are encountered during project implementation, project personnel shall avoid altering the materials and their context until a cultural resource consultant has evaluated the situation. Project personnel should collect no cultural resources. Prehistoric resources include chert or obsidian flakes, projectile points, mortars, and pestles; and dark friable soil containing shell and bone, dietary debris, heat-affected rock, or human burials.

Historic resources include stone or adobe foundations or walls; structures and remains with square nails; and refuse deposits, often in old wells and privies. Identified cultural resources should be recorded on forms DPR 422(archaeological sites) an/or DPR 523 (historic properties) or similar forms.

CIRCULATION AND PARKING

There are two arterial streets near by the project site. Petaluma Avenue (Gravenstein Highway) runs northwest to southeast and Sebastopol Avenue (Highway 12) which runs northeast to southwest; both are state highways. Sebastopol Avenue is a two lane street. Petaluma Avenue is a one way street and is the northbound leg of State Highway 116 through town. The definition of an arterial streets is as follows: a roadway designed to carry heavy traffic volumes at relatively lower speeds (25-35

mph). Some arterial streets have medians to control cross traffic. Separate turning lanes are usually provided, and signals control major intersections. Within the Sebastopol Planning Area arterials are to be limited for the most partto two lanes.

Both Petaluma Avenue and Sebastopol Avenue are designated as scenic roadways within the Sebastopol Planning Area.

These two streets intersect in downtown Sebastopol. This intersection is the primary vehicular intersection adjacent to the project site. Existing Intersection Level of Service conditions for this intersection are Level of Service C in the morning, and Level of Service of D/E in the afternoon and evening. The California Department of Transportation (Caltrans) is currently preparing construction documents for widening a portion of Highway 12 from the Laguna Bridge eastward.

Morris Street is an important local street adjacent to the site. A Local Street is defined as a street that provides access to destinations within a residential neighborhood or business district. Local streets may be loop streets or cul-de-sacs. Travel distance to a collector street should be short, not much longer than half a mile.

Morris Street is important for two reasons. First of all it provides the main access to the existing Laguna Park. Secondly, its length provides additional parallel parking for weekend park users.

A recreation trail crosses the study area along the the former Petaluma & Santa Rosa Railroad alignment. This is a regional recreation trail that is part of a planned county system. Currently the trail ends at Petaluma Avenue. It picks up again on the other side of Sebastopol Avenue where north main turns into High School Road. The recreation trail is designed as a multi-use trail. It accommodates hikers, bicyclists, and equestrians.

RECREATION NEEDS

Currently there are no recreation user surveys, studies or other detailed information that definitively describes the recreation opinions and attitudes of the local community.

However, through information provided by the City and members of the TAC, opinions expressed by members of the community during several public workshops, information available from the California Department of Parks and Recreation, (CDPR), and field observations, made by the design team, several assumptions can be made about the recreation needs of the community.

The following are the conclusions that the design team made regarding recreation needs in the planning area after reviewing the various information resources described above (see appendix 1 through 3 for additional information):

CDPR User Survey

Although the CDPR survey is statewide in scope, many of the conclusions drawn by the study apply to local opinions and attitudes.

Californians feel strongly that protection of the natural environment is important for outdoor recreation. Furthermore, preservation of natural areas for use by future generations is a high priority.

Nature-oriented parks or reserves are the preferred type of outdoor recreation for most Californians, although highly developed parks and recreation areas are visited the most often.

Based on latent (unmet) demand and public support, the eight outdoor recreation activities that Californians believe should have top priority for the expenditure of public funds are as follows:

1. Walking
2. Bicycling
3. Camping
4. Birdwatching/nature study
5. Picnicking in developed sites
6. Beach activities
7. Outdoor cultural events
8. Visiting museums / zoos / historic sites

Californians tend to support funding park and recreation areas through "sin" taxes and increased fees for special facilities while opposing increases in general forms of taxation

A significant majority of Californians believe spending should be increased for the protection and management of natural and cultural resources.

Sebastopol Little League
The number of children participating in Sebastopol Little League has grown from 568 to 1140 (95%) over the last six years.

There is a significant demand for senior league playing fields. Currently, 42 teams play on two senior league fields (this includes three high school teams). The growth projection for the 1992 season in the 13-18 year age group is an additional 5 teams or 65 players.

Approximately 66% of the children participating in the Sebastopol Little League are from beyond the city limits and sphere of influence. This number was derived by counting the number of children participating in little league from the Sebastopol Union School District.

Sebastopol Little League makes a significant contribution in the form of capital improvements and maintenance to the athletic fields located in city parks.

Environmental Education Facilities
There is a significant need for environmental education facilities that provide tours and interpretive experiences. Currently there are two such facilities in Sonoma County, and they are booked solid by the beginning of each school year.

1990-91 enrollment for Sebastopol Union School District (K-8) was 1,236. 25% of the field trips for schools in the Sebastopol Union School District (Park Side, Pine Crest, & Brook Haven) were for environmental studies. 62% of these environmental field trips were by the third through fifth graders. K through 2nd grades accounted for 34% of the trips and 6th through 8th grades accounted for 4% All of these trips were funded by donated money.

There is a wide variety of opinion in the community regarding the Laguna, city recreation facilities & programs, and park maintenance (see appendix 3 for summary of community workshop input). Although strong emotions were present in the expressions of many opinions at the pubic workshops, caution must be taken when considering this input for park development. Workshops are excellent for obtaining fresh insights to design programs and solutions, as well as sampling the spectrum of community attitudes and opinions. They are not reliable however, in judging, in a scientific fashion, percentages with which the community agrees or disagrees with a particular design concept or plan. For this opinion polls such as the CDPR study sighted earlier are required.

In the absence of specific opinion and attitude surveys, judgements and opinions by professionals, representatives of community interest groups and city officials must be used in developing concepts that reflect and protect the community interest.

RECREATION FACILITIES

Currently there are approximately 17.5 acres of park land within the City. The City's existing parkland consist of five parks as follows:

Ives park	6.0 Acres
Libby Park	6.0 Acres
Spooner Park	0.5 Acres
Laguna Youth Park	5.0 Acres
Total Park Area	17.5 Acres

The National Recreation and Parks Association recommends a minimum of 4 acres per 1000 population. On this basis with a current population of approximately 7,300, Sebastopol should have approximately 29.2 acres of park land.

Another frame of reference are the requirements of Section 66477 of the Government Code of the State of California, adopted by the Sebastopol City Council in 1969, commonly known as the Quimby Act. The Quimby act calls for five acres of property for each one thousand persons residing within the City be devoted to local park and recreation purposes. On the basis of the Quimby Act, Sebastopol should have approximately 36.5 acres.

It is worthwhile to note some important considerations at this point. First of all national standards do not reflect the local community desires and needs. These standards are a "yardstick" with which to measure relationships to nationwide minimums. They do not reflect the specific needs and desires of a particular local community or region. They should be used as a starting point with which to develop standards tailored to individual community requirements.

Furthermore, what is physically the City of Sebastopol, is not necessarily the City's park service area. The percentage of little league participants that reside within the city limits in relationship to the overall number of participants is a prime example.

As noted in the Downtown Plan (Economic Analysis) Volume II, Bruce Lord, October 1991, although the City has a population of 7,300, it actually services a population of 38,000 in the west county area.

This concept of the "under bounded city" is an issue that the City decision makers will continue to face not only in parks and recreation issues, but other service and growth questions as well.

Existing Ballfields

As part of this master plan, a survey of existing ballfields was included in order to possibly identify underutilized ballfields as well as to better understand the significance of the existing ball fields within the study area in relationship to the City's needs

Of the three community parks and five public schools within the Sebastopol city limits, four of the schools and two of the community parks provide ballfield facilities to the community. In addition to the facilities within the City four soccer fields and one baseball field are available at Ragle Ranch Regional Park directly east of the city limits. **Table 3** summarizes the ballfield facilities currently available within the city limits.

TABLE 3
EXISTING BALLFIELDS WITHIN THE CITY LIMITS

Facility	Baseball Field	Soccer Field	Football Field
Brookhaven School	1	0	1
Parkside School	1	0	0
Ives Park*	1	0	0
Analy Union High School	2	0	1
Pinecrest School	1		
Laguna Park*	2	0	0
Total	**8**	**0**	**2**

* Denotes City Park Facility

Of the baseball fields described in Table 1 all but the one at Pinecrest are used by the Sebastopol Little League for league games. With some renovation this field may be useable as well.

The following are general guideline ratios for athletic facilities per community populations. The guidelines are prepared by the National Recreation and Park Association. As stated previously, they are intended to be used as a starting point for local agencies in determining their community's park and recreation needs.

Activity	No. of Units per Population	Service Radius	Notes
Baseball	1 per 5000	1/4-1/2 Miles	Part of neighborhood Complex
Football	1 per 20,000	15-30 min. travel	Usually part of a Community park complex
Soccer	1 per 10,000	1-2 Miles	Number of units depends on popularity

Using these standards a population of 7,300 people, would require 1 to 2 baseball fields. a population of 38,000, would require a minimum of 8 ballfields.

VIEWS AND VISTAS

The City's general plan and Sonoma County's general plan describe the desired visual image of Sebastopol as a small town in a rural setting. According to the general plan, scenic resources which contribute to the small town image include: the predominance of low rise, small scale buildings, meandering rural streets, natural drainage channels, varied topography, surrounding agricultural lands which encroach into existing urbanized area; the presence of farm animals; existing vegetation including trees, grasses, and riparian corridors; and a community size which allows people to recognize and interact with one another.

Given the preceding description it becomes immediately obvious that the Laguna de Santa Rosa and surrounding environs make an extremely important contribution to the desired visual image.

The concept of viewsheds is extremely important in defining and analyzing visual resources. For purposes of this plan, a viewshed is defined as all the surface areas visible from an observer's viewpoint. Given this definition there are almost an infinite number of viewsheds within any project because there are an infinite number of viewing stations. Therefore, a certain amount of discretion must be used when describing viewsheds in the planning area.

Through field visits and analysis of site photographs, the design team has identified six major viewsheds within the study area (see Figure 3 Views). The viewsheds are defined on one edge by the physical limits of the planning area. In some cases this may be a physical barrier such as the edge of a riparian area. In other instances it may be a legal limit such as a property line. The other edge of a viewshed is defined by the limit of the viewers vision,

which may be a physical barrier such as a riparian edge or it may be the distance at which a view can distinguish major visual features (this distance is considered to be a maximum of 3 miles).

Other elements that affect the perception of a viewshed are characteristics of the viewer, such as viewer activity and viewer sensitivity.

Considering the visual character of the site as well as that of the adjacent land uses, the design team has determined that two of the viewsheds are critical to the planning effort. These are viewshed #2 and viewshed # 3 as shown in Figure 3. These two viewsheds will be most directly affected by planning and development decisions that the City makes inside and outside of the planning area boundaries.

As shown in Figure 4, there are several existing land uses within the planning area. Most of the land directly to the east of the Laguna is owned by public agencies. Currently the majority of this area is used for apple waste disposal and waste water dispersion.

The parcels north of Highway 12 and east of the Laguna are zoned wetlands. The City currently owns a large portion of this area which makes it a prime focus for future park incorporation and development.

The land use west of the Laguna within the city limits ranges from public facilities to industrial, commercial, and residential. North of Highway 12 the City currently owns several parcels which are zoned Community Facility District. For the most part these parcels abut the Laguna and are a prime focus for park development.

South of Highway 12, one large parcel known as the Railroad Forest is designated as a wetland which makes it a prime candidate for acquisition and incorporation into the Laguna park.

South of Highway 12 between the west bank of the Laguna and the city limit there are several large county parcels zoned Diverse Agriculture, Rural Residential, and Land Extensive Agriculture.

In the past there have been proposals to incorporate portions of this area into the City of Sebastopol as a Planned Community District.

MANAGEMENT CONFLICTS

A number of existing or potential land management activities conflict with the ecological resource preservation and restoration goals of the Master Plan.

Barlow Field

The continued disposal of apple waste effluent through spray irrigation at the Barlow field has had a negative effect on the existing oak woodland at the site. In addition, when the Barlow field floods or soils are too saturated to irrigate, the City has reserved on of the old sewage ponds as emergency storage for apple waste. Long term plans for the future use of the filed include an option to restore native plant communities (City Ordinance # 57/58) and utilize reclaimed water from the subregional system for wetland enhancement and creation (Waaland, 1990). The potential to achieve restoration at this site hinges on the partial or complete removal of effluent irrigation by finding another means of disposal. A wastewater engineering analysis to assess the apple waste processing needs and alternative means of disposal has been initiated by the City (Davis, personal communication).

Brown Farm

Old Sewage Ponds: As mentioned above, one of the old sewage ponds proposed for restoration will be required as an emergency backup for the storage of apple waste when weather conditions do not permit the irrigation of effluent onto Barlow field. It is possible to restore the marsh and allow this emergency use only if it occurs very infrequently. Otherwise, restoration will have to await development of an apple waste treatment system which is independent of emergency storage in the old sewage ponds. Abatement of fill in pond #5 required by the USACE and DFG involves breaching of the dikes on ponds # 4 and 5, leaving old pond # 3 as the only one available for emergency storage.

Brown Farm: The Subregional Water Reclamation System manages this site for reclaimed water irrigation. At present, the cross-ponds are required to collect any incidental summer runoff. Long term plans include an option to restore native plant communities and utilize reclaimed water for wetland enhancement and creation (Waaland, 1990). The potential to restore this area depends on adoption of the long-term water plan.

Urban Setting

There are inherent conflicts between wildlife preservation and conditions surrounding the functions of a City. Security, access, liability and unregulated activities are issues that arise at the interface of public and private land. Many of these concerns can be avoided or minimized through buffering of sensitive habitats, appropriate trail location and key purchases of private lands.

Passive Recreation

Unless sensitive habitats are identified and avoided, hiking trails can intrude into areas previously remote enough for certain secretive wildlife to inhabit.

Active Recreation

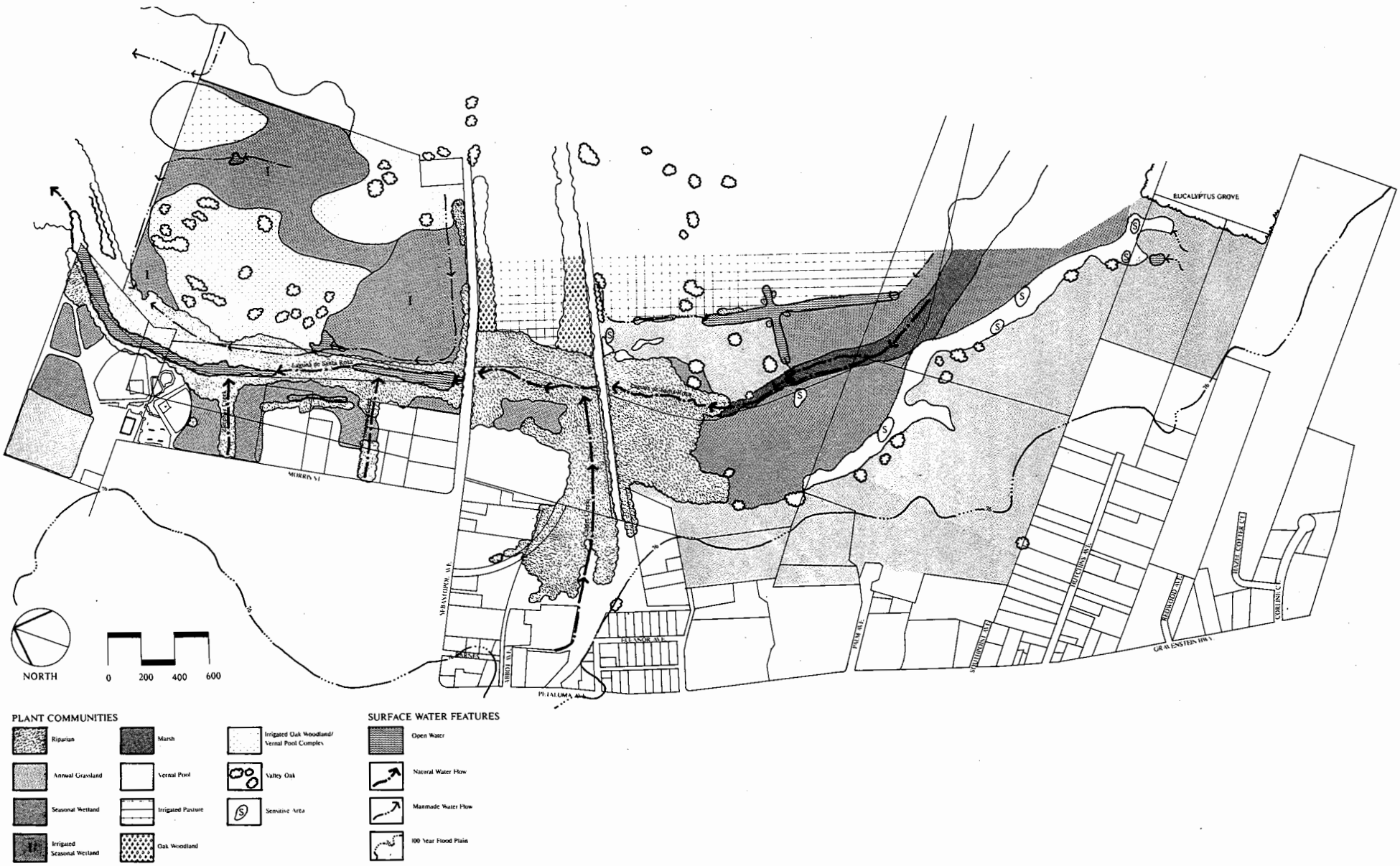
Ballfields and intensive concentration of human use (i.e. picnic grounds) has the potential to prevent use of natural areas by wildlife if not properly screened and buffered.

Highway 12 Widening

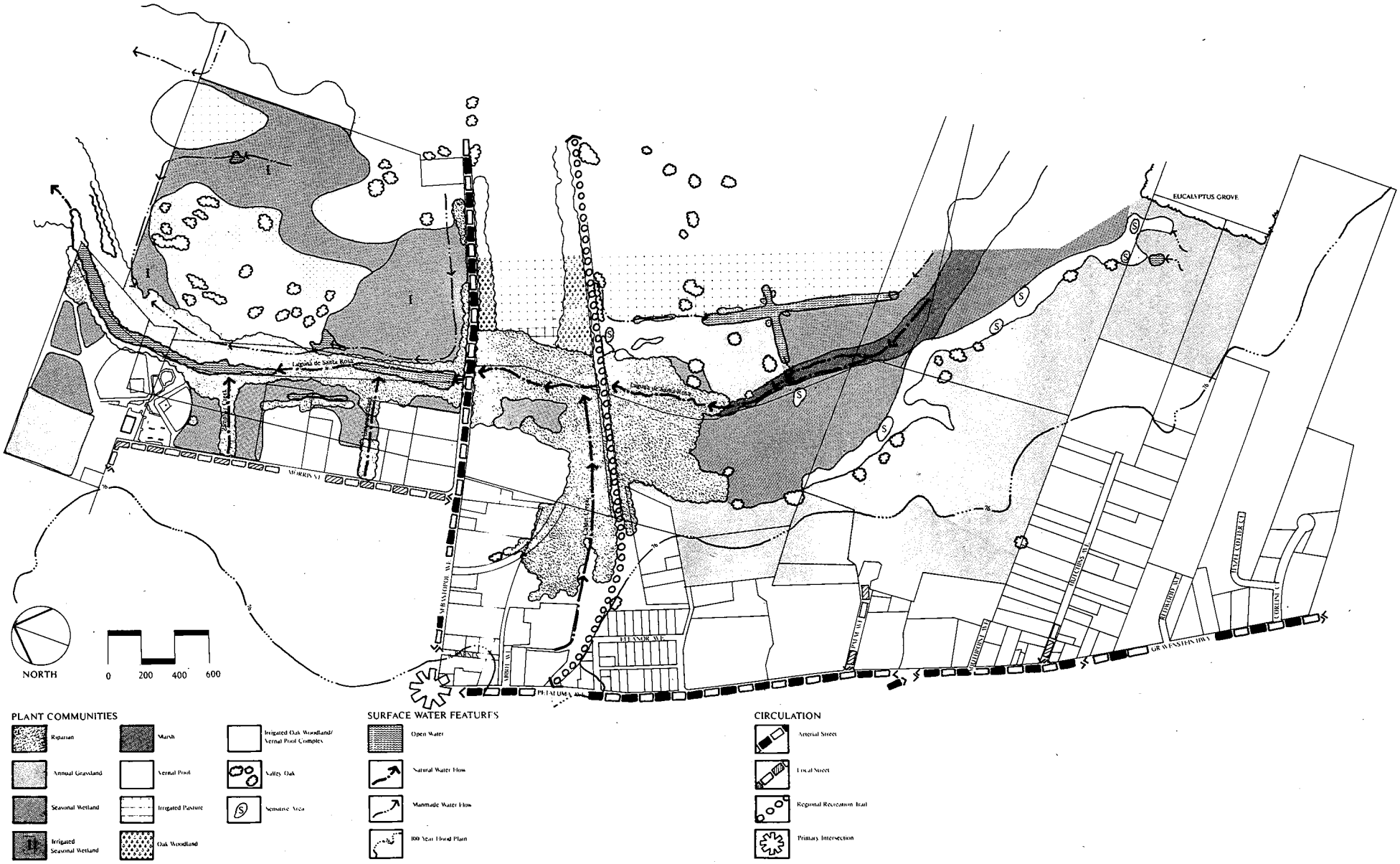
CALTRANS plans to widen Highway 12 will remove mature oak trees which are recommended for preservation as par tot the natural resource management program in the study area.

Mosquito Abatement Practices

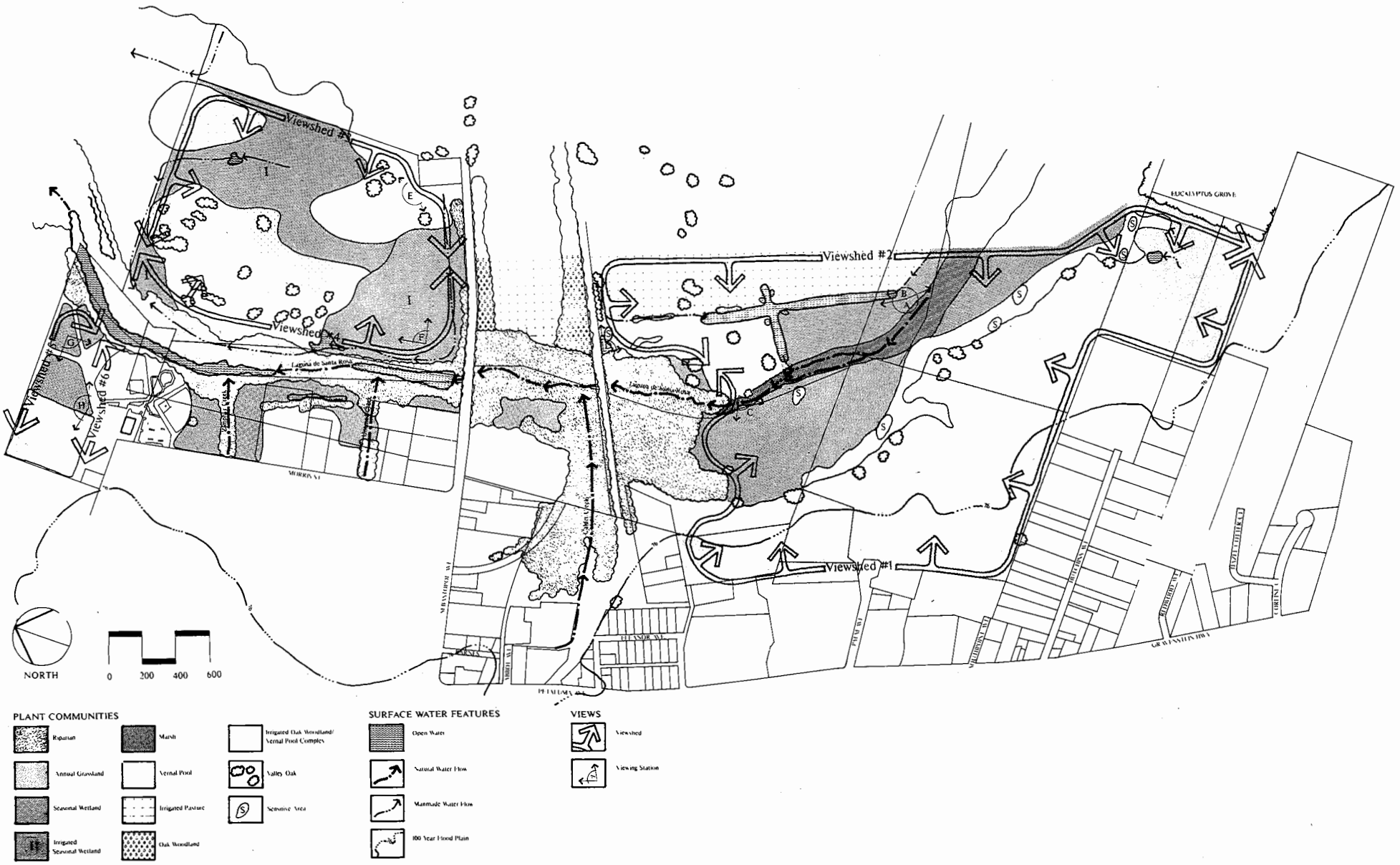
Routine dredgeing of tributary streams to the Laguna and the use of herbicides along channels has a degrading effect on wildlfie habitats and prevents acheivement of restoration goals for vegetation, fisheries and wildlife. Dredge spoils which are levelled onto wetlands adjecent to excavted waterways cause the loss of wetlands and result in weed control problems.



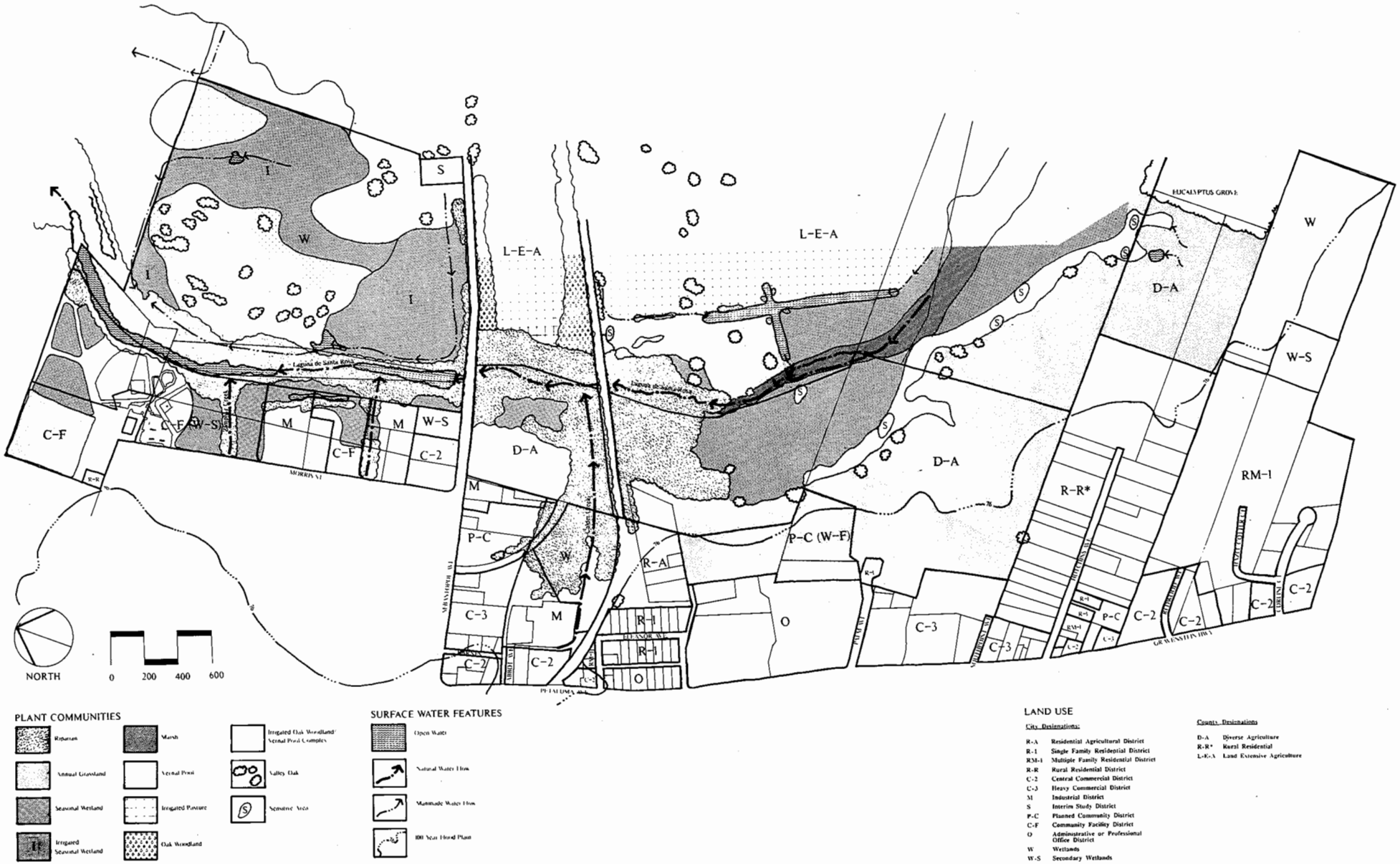
Existing Plant Communities and Surface Water Features Figure 1



Existing Circulation Figure 2



Existing Views Figure 3



PLANT COMMUNITIES

- Riparian
- Annual Grassland
- Seasonal Wetland
- Irrigated Seasonal Wetland
- Marsh
- Vernal Pool
- Irrigated Pasture
- Oak Woodland
- Irrigated Oak Woodland/ Vernal Pool Complex
- Valley Oak
- Sensitive Area

SURFACE WATER FEATURES

- Open Water
- Natural Water Flow
- Manmade Water Flow
- 100 Year Flood Plain

LAND USE

City Designations:

R-A	Residential Agricultural District
R-1	Single Family Residential District
RM-1	Multiple Family Residential District
R-R	Rural Residential District
C-2	Central Commercial District
C-3	Heavy Commercial District
M	Industrial District
S	Interim Study District
P-C	Planned Community District
C-F	Community Facility District
O	Administrative or Professional Office District
W	Wetlands
W-S	Secondary Wetlands
W-F	Wetlands Influence

County Designations

D-A	Diverse Agriculture
R-R*	Rural Residential
L-E-A	Land Extensive Agriculture

Existing Land Use Figure 4

OPPORTUNITIES & CONSTRAINTS

The following is an analysis of the major site opportunities and constraints that the planning team has identified for the development of the Laguna de Santa Rosa Park Master Plan.

This opportunities and constraints analysis focuses on three areas of concern. They are, natural resource preservation and enhancement, public access, and additional passive and active recreation activities at the Laguna Youth Park and abandoned sewer ponds.

NATURAL RESOURCES

Habitats of Concern

Opportunity

Preserve existing vernal pools, marshes oak woodland and riparian forest

Constraint

Increased public access may impact wildlife

ncompatible adjacent development may impact wildlife

The soft soils and vegetation in wetlands make them susceptible to damage from repeated trampling along newly established or unofficial trails

Species of Concern

Opportunity

Restoration in this area would provide a reasonable expectation of returning the endangered California yellow-billed cuckoo to the mouth of Santa Rosa Creek. Other rare or endangered species associated with riparian habitat that would benefit from this enhancement are: yellow warbler, wood duck, osprey, bald eagle, willow flycatcher, yellow-breasted chat, red-legged frog, western pond turtle, ringtailed cat and the California freshwater shrimp.

Constraint

Improved access to remote areas with endangered species or sensitive wildlife resources could disrupt nesting and feeding activity of wildlife.

Cats and dogs, both feral and domestic, poses a serious problem to ground nesting birds, small mammals and waterbirds.

Restoration and Enhancement of Native Plant Communities

Opportunity

Restore riparian forest, oak woodland and freshwater marsh on suitable sites in the study area.

Constraint

Existing uses (i.e. Barlow field wastewater irrigation) are incompatible with restoration goals

The potential to restore areas on lands owned by City of Santa Rosa will be unknown until a formal cooperative arrangement can take place

Enhancement of Fishery Resources

Opportunity

The Laguna's riverine rearing habitat for salmonids can be enhanced by creating a low flow channel with pool riffle sequences, meanders, cut-banks and in-stream logs and boulders to provide cover for fish.

Planting native trees and shrubs along the Laguna and its tributaries will provide habitat for aquatic insects which are an important prey resource for steelhead trout.

Tributaries of the Laguna, such as Gravenstein Creek, Calder Creek and Zimpher Creek, can be restored to decrease water

temperatures flowing into The Laguna and provide habitat to expand the salmonid population

Constraint
Non-point source pollution from urban areas and dairy farms continues to degrade the Laguna's water quality keeping the aquatic habitat marginal for salmonids

The Sonoma-Marin Mosquito Abatement District's practice of dredging the Laguna's tributaries is incompatible with restoration goals

Water Quality

Opportunity
Restoring the Laguna and its tributaries will by increasing the shade over the low flow channel to decrease water temperature to the ranges tolerated by salmonids and improve overall water quality

Routing urban stormdrain outfalls into wetland retention basins will improve Laguna water quality

An alternative apple waste treatment method will reduce the amount of BOD in the Laguna and adjacent wetlands

Dairy operations can utilize treatment marshes to improve quality of their effluent

Constraint
The Sonoma-Marin Mosquito Abatement District's practice of dredging the Laguna's tributaries is incompatible with restoration goals

Alternative disposal methods for apple waste will increase operational costs

Interpretation of Natural Resources

Opportunity
A trail system can be designed and installed to avoid damage to existing habitats and species of concern while increasing public access to the Laguna

Appropriately designed interpretive signage, along with brochures at the trailheads, can be installed to further the aims of public education about wise resource use

Constraint
Park staff, either volunteer or paid, will be necessary for docent led hikes, interpretive events and monitoring public use

PUBLIC ACCESS

Interpretation of Natural Resources

Opportunity
A trail system can be designed and installed to avoid damage to existing habitats and species of concern while increasing public access to the Laguna.

Appropriately designed interpretive signage, along with brochures at the trailheads, can be installed. to further the aims of public education about wise resource use

Constraint
Increased park staff, either volunteer or paid, will be necessary for docent led hikes, interpretive events and monitoring public use.

LAGUNA YOUTH PARK & ABANDONED SEWER POND SITE

This third area of focus is due directly to the intense and often competing demands for additional passive and active recreation facilities from the community. These demands have focused on the Laguna Youth Park and abandoned sewer site primarily because it is the only site readily available without major acquisition costs. Furthermore, the community's desire to avoid further development encroachment into the Laguna on other publicly owned land (i.e. The Barlow Field) has further intensified the focus on the Laguna Youth Park and abandoned sewer site

The following is the list of additional active and passive recreation uses desired by the community. This list was developed after

several public workshops and TAC meetings Also listed are the existing recreation elements on the site which shall remain, and new recreation elements approved for the site by the City Council prior to the planning process.

New Recreation Elements

1. Expansion of the existing recreation trail
2. Outdoor amphitheater
3. Interpretive trails
4. Nature area viewing deck
5. Habitat enhancement
6. Group picnic area
7. Renovation and enhancement of existing ponds
8. Parking

Existing Recreation Elements

1. Community center
2. City corporation yard
3. Dance Hall
4. Little League field
5. Senior League field
6. Parking
7 Playground

New Recreation Elements Approved Prior to the Plan

1. Community center expansion
2. Teen center
3. Skateboard Park

To analyze the opportunities and constraints presented by the proposed additional passive and active recreation uses on the Laguna Youth Park site, two different site plans were developed. The purpose of this approach was to explore the range of options available from the proposed program elements and analyze which combination

As part of the analysis process for these alternative plans the planning team developed a use Relationship Decision Matrix (see figure 7.

This matrix compares each of the existing and proposed program elements to one another. a value relating to a degree of desirability of the use relationship is assigned thus allowing the planners and decision makers to evaluate the use relationships of the proposed plans.

The following is a brief description of the main elements of each plan.

Concept Detail Area Plan Scheme A

Plan A's theme (see figure 5) groups several of the proposed passive elements to create an outdoor environmental education center. Active elements are then incorporated into the design as much as good use relationship, spatial requirements and aesthetics appropriate to the visual resources of the Laguna will allow.

1. **New Open Water Configuration:** A new open water configuration for the wetland area to the south of the existing park is proposed. This open water will provide an excellent visual connection for the park to the Laguna as well as providing additional open water habitat.

2. **Renovated Wetland Habitat:** Renovation of the existing wetland habitat is proposed for the areas adjacent to the new open water configuration as well as the renovated pond area.

3. **Interpretive Kiosk and Viewing Deck:** A viewing deck and interpretive kiosk will be placed adjacent to the new open water configuration and just west of the existing Little League field. This location was selected because of its high visibility. Panels at the kiosk will inform park users of the other passive and interpretive facilities in the park.. Another interpretive kiosk and viewing deck are proposed at the amphitheater. The combination of these elements will create and effective outdoor environmental education facility.

4. **Existing Ballfields:** There are no proposed changes for these facilities.

5. **Existing Playground:** There are no proposed changes for this facility except for the relocation of the existing fence between the playground and the Laguna. The fence will move 20 to 30 feet to the west. See item #8 for additional information.

6. **Existing Community Center:** The Community Center will have a 625 foot classroom addition to replace the existing trailer located behind the building. The only other proposed change to the Community Center in this scheme is the elimination of the service drive behind the center. This area will be converted to lawn and landscaping for the park.

7. **Teen Center:** The configuration for the teen center was taken from a site plan prepared by Robert E. Anderson Architects. The Hyden Associates concept plan resites the teen center with an orientation to the parking lot. The center is set back in order to provide for the grade change necessary to bring the building above the 100 year flood level. The set back is generous enough to allow for a variation in slope as well as ample landscaping.

8. **Relocated Picnic Facility:** The existing picnic table adjacent to the playground are relocated into a group picnic facility more central to the park. This relocation allow the area currently used for picnicking to continue the reversion to a wetland it has already begun.

9. **New Parking Lot:** A new parking lot is proposed for the area adjacent to the amphitheater and renovated ponds. This new 69 space lot will provide additional parking for the proposed passive- and nature-interpretive uses as well as parking for the proposed teen center. In addition it will make up the 17 space deficit that currently exists at the park.

10. **Existing Weischmann Dance Hall:** There are no proposed changes for this facility.

11. **Amphitheater/Outdoor Classroom:** A sixty seat amphitheater/outdoor classroom will be located in the passive area of the park north of the renovated ponds. The amphitheater/outdoor classroom will be oriented with a view of the renovated ponds and the Laguna beyond. It will have a ten foot stage and retaining wall type seating. Native trees shrubs and ground covers will be used for adjacent landscaping.

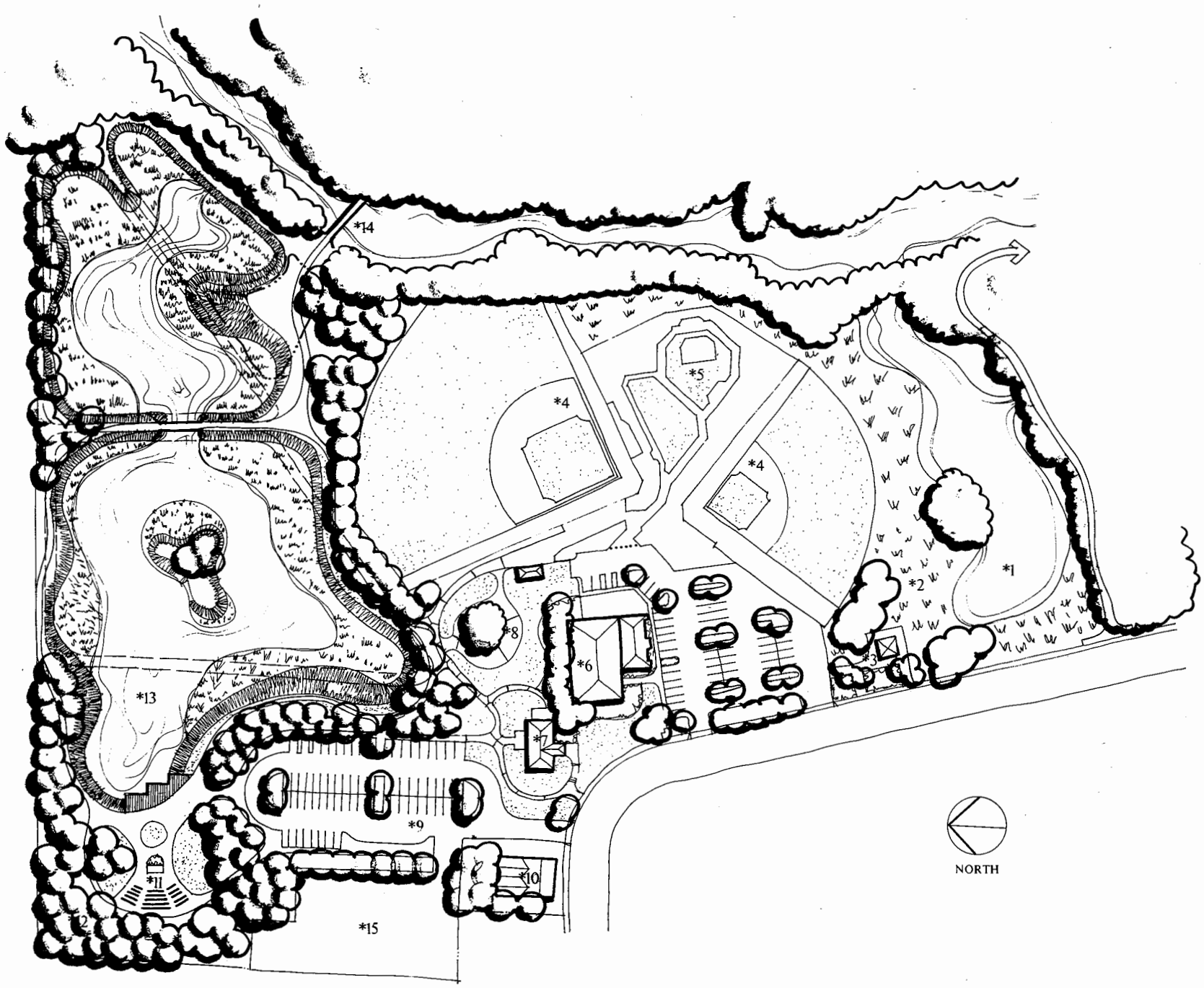
12. **Native Tree Buffer:** Groves of native trees will be planted to create a buffer effect between park uses and existing land uses adjacent to the park. The tree buffer depth will range from eighty to forty feet in depth. The trees will be selected for their ability to provide food and cover for wildlife as well as for their screening capabilities.

13. **Renovated Ponds:** The former waste treatment ponds located on the Laguna Park site will be renovated and restored to appropriate wetland habitat. The renovation will consist of removal of fill, reshaping to a more natural configuration, replanting with suitable wetland plants, and the possible introduction of water level fluctuation from the Laguna. Wherever possible, the 2:1 slope of the existing ponds will be regraded to a gentler and less geometric slope. This will not only improve the aesthetic aspect of the pond, but it will also increase the safety of the path to pond edge relationship (see cross section). Mitigation of the City's unauthorized fill issue with the Army Corps of Engineers will be part of this element.

14. **Interpretive/Nature Trail Pedestrian Bridge:** A pedestrian bridge across the Laguna will provide access to the east side of the Laguna.

15. **Relocated City Storage Yard:** The City Storage Yard has been relocated as shown.

16. **Handicap Accessible Interpretive Path:** A new handicap accessible interpretive path system will be developed around the renovated ponds.



Concept Detail Area Plan Scheme A figure 5

Concept Detail Area Plan Scheme B
Scheme B starts with an active theme (an additional senior league field) and then incorporates passive elements using the same criteria of good use relationship, spatial requirements and aesthetics.

1. **New Open Water Configuration:** A new open water configuration for the wetland area to the south of the existing park is proposed. This open water will provide an excellent visual connection for the park to the Laguna as well as providing additional open water habitat.

2. **Renovated Wetland Habitat:** Renovation of the existing wetland habitat is proposed for the areas adjacent to the new open water configuration as well as the renovated pond area.

3. **Interpretive Kiosk and Viewing Deck:** A viewing deck and interpretive kiosk will be placed adjacent to the new open water configuration and just west of the existing Little League field. This location was selected because of its high visibility. Panels at the kiosk will inform park users of the other passive and interpretive facilities in the park.. Another interpretive kiosk and viewing deck are proposed at the amphitheater. The combination of these elements will create and effective outdoor environmental education facility.

4. **Existing Ballfields:** There are no proposed changes for these facilities.

5. **Existing Playground:** There are no proposed changes for this facility except for the relocation of the existing fence between the playground and the Laguna. The fence will move 20 to 30 feet to the west. See item #8 for additional information.

6. **Existing Community Center:** The Community Center will have a 625 foot classroom addition to replace the existing trailer located behind the building. The only other proposed change to the Community Center in this scheme is the elimination of the service drive behind the center. This area will be converted to lawn and landscaping for the park.

7. **Teen Center:** The configuration for the teen center was taken from a site plan prepared by Robert E. Anderson Architects. The Hyden Associates concept plan resites the teen center with an orientation to the parking lot. The center is set back in order to provide for the grade change necessary to bring the building above the 100 year flood level. The set back is generous enough to allow for a variation in slope as well as ample landscaping.

8. **Relocated Picnic Facility:** The existing picnic table adjacent to the playground are relocated into a group picnic facility more central to the park. This relocation allow the area currently used for picnicking to continue the reversion to a wetland it has already begun.

9. **New Parking Lot:** A new parking lot is proposed for the area adjacent to the Teen Center and new Senior League Ballfield This new 12 space lot will provide additional parking for the proposed ballfield as well as parking for the proposed teen center.

10. **Existing Weischmann Dance Hall:** There are no proposed changes for this facility.

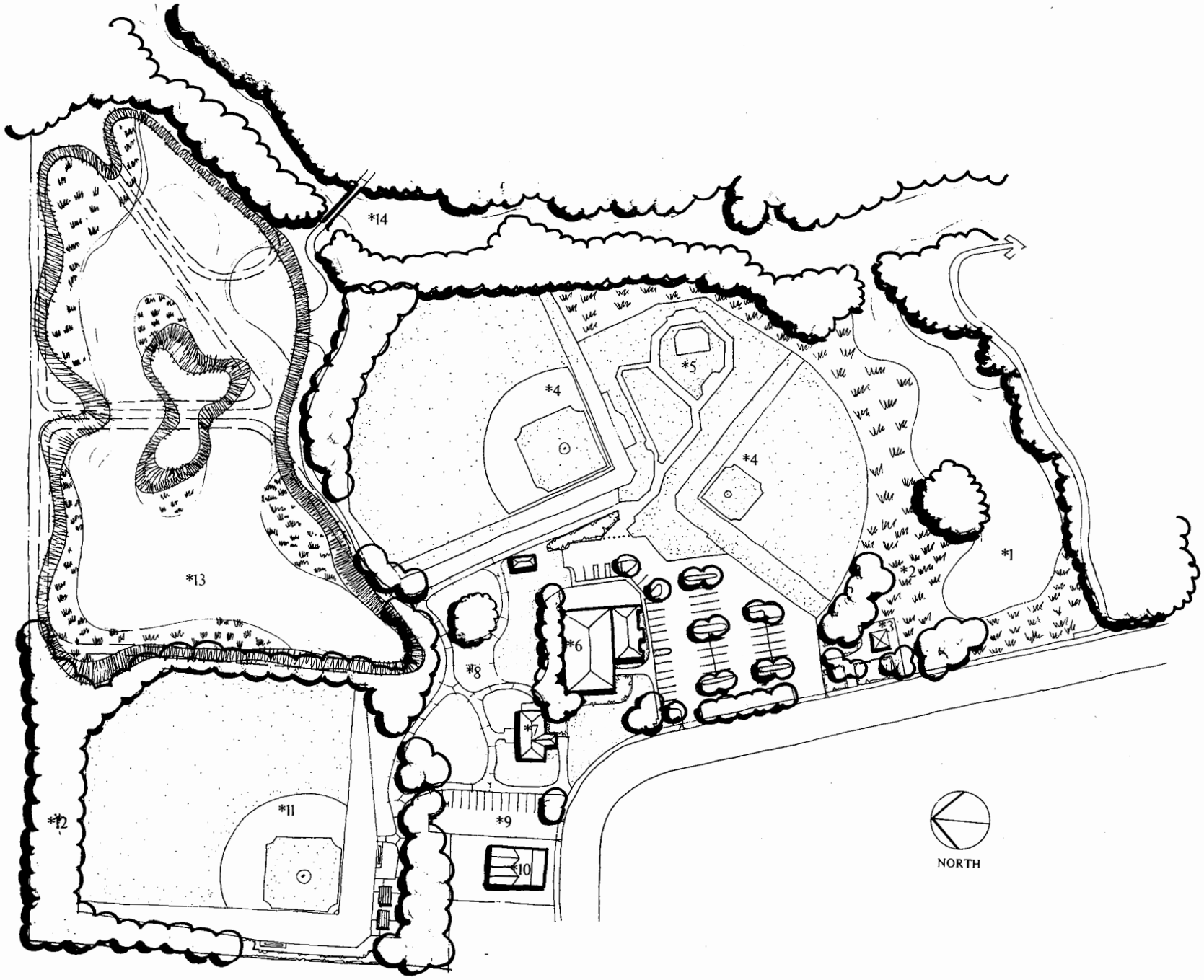
11. **New Senior League Baseball Field:** This new baseball field will provide an additional senior league facility at the park. Due to site constraints, the right field fence will be 280 feet. This is 20 feet short of the optimum 300 feet. Bleachers will be provided on the south side of the field. A native tree buffer will be placed around the field for a transition buffer to the adjacent renovated pond and private property. A chain link fence will be placed along the right and center field as a safety precaution between the playing field and the renovated pond.

12. **Native Tree Buffer:** Groves of native trees will be planted to create a buffer effect between park uses and existing land uses adjacent to the park. The tree buffer depth will range from eighty to forty feet in depth. The trees will be selected for their ability to provide food and cover for wildlife as well as for their screening capabilities.

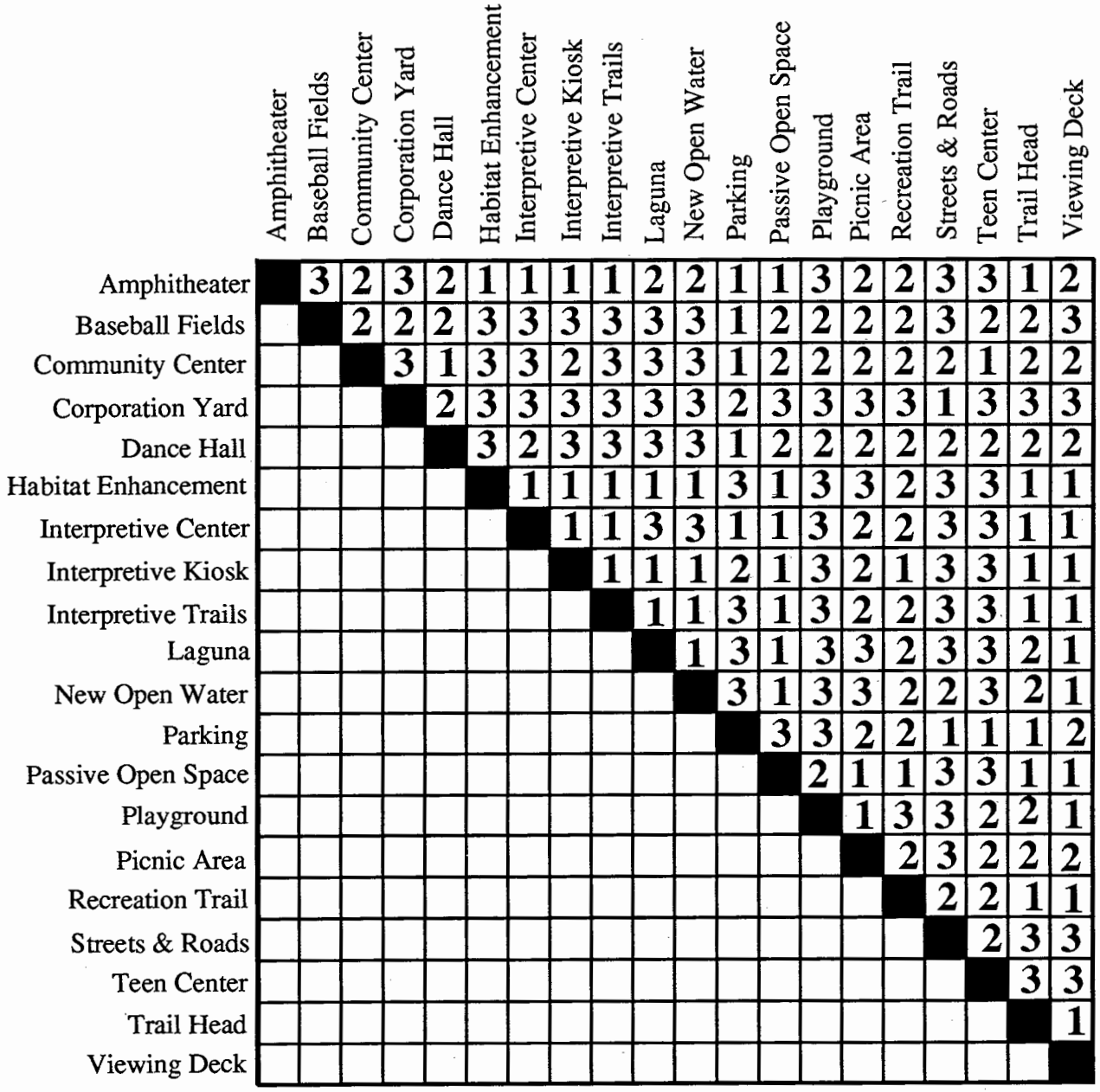
13. **Renovated Ponds:** The former waste treatment ponds located on the Laguna Park site will be renovated and restored to appropriate wetland habitat. The renovation will consist of removal of fill, reshaping to a more natural configuration, replanting with suitable wetland plants, and the possible introduction of water level fluctuation from the Laguna. Wherever possible, the 2:1 slope of the existing ponds will be regraded to a gentler and less geometric slope. This will not only improve the aesthetic aspect of the pond, but it will also increase the safety of the path to pond edge relationship (see cross section). Mitigation of the City's unauthorized fill issue with the Army Corps of Engineers will be part of this element.

14. **Interpretive/Nature Trail Pedestrian Bridge:** A pedestrian bridge across the Laguna will provide access to the east side of the Laguna.

15. **Handicap Accessible Interpretive Path:** A new handicap accessible interpretive path will be developed on the south side of the renovated pond between the pond and the existing senior league field. This path will consist of a six foot wide asphalt path. A viewing area with interpretive signage.will be located in the area of the Pedestrian Bridge. On the east side of the bridge the handicap accessible path will transition into a interpretive trail consisting of a 5 foot wide earth path.



Concept Detail Area Plan Scheme B figure 6



Use Decision Matrix figure 7

Scheme A & B Analysis

The following is a summary of the analysis of scheme A & B. Each scheme is analyzed by the following criteria.

1. Goals of the Plan
2. Use Relationships
3. Spatial and aesthetic relationships appropriate to parks and recreation development

Existing recreation facilities on the site as well as new facilities already approved by the City Council are not a part of this analysis. Although the following analysis does consider these existing and approved facilities as they relate to the new proposed elements.

New Open Water Configuration

SCHEME A

Opportunities

This feature will add new open water habitat to the park area. It will be an additional aesthetic element that will major a major visual connection between the Laguna and the City.

Constraints

This is not a desirable relationship to the existing ballfields.

SCHEME B

Opportunities

Same as Scheme A

Constraints

Same as Scheme A

Renovated Wetland Habitat

SCHEME A

Opportunities

This feature will increase the quality of the existing wetland habitat adjacent to the park area. It will be an excellent addition to the aesthetic aspects of the open water feature.

Constraints

This is not a desirable relationship to the existing ballfields.

SCHEME B

Opportunities

Same as Scheme A

Constraints

Same as Scheme A

Interpretive Kiosk and Viewing Deck

SCHEME A

Opportunities

This feature will bring interpretation and environmental education element to the park that is greatly needed. It has a good use relationship to the open water configuration, and an additional kiosk and viewing deck and kiosk in conjunction with the amphitheater,renovated ponds and handicap accessible trail will make and excellent outdoor classroom.

Constraints

This is not a desirable relationship to the existing ballfields.

SCHEME B

Opportunities

This feature will bring interpretation and environmental education element to the park that is greatly needed. It has a good use relationship to the open water configuration.

Constraints

Same as Scheme A

Relocated Picnic Facility

SCHEME A

Opportunities

This will create a better picnic facility for the park area. By grouping the existing tables they can serve individual families as well as larger groups. The relocation provides a central location to the park and it allows reclamation of a portion of the wetland adjacent to the existing site.

Constraints

There are no significant constraints for this facility

SCHEME B
Opportunities
Same as Scheme A

Constraints
Same as Scheme A

New Parking Lot

SCHEME A
Opportunities
The parking lot in this scheme provides 69 car spaces and two bus spaces for use by the outdoor classroom and the active elements of the park as well. This additional parking lot also relieves the existing parking shortfall in the park and it supplies the spaces required for the teen center and the community center expansion. In addition it helps buffer the relocated city corporation yard from the rest of the park.

The size of this lot may be reduced if the City can reach a practical agreement to use existing parking of the adjacent commercial and industrial building. This arrangement will need to meet the shared requirements of the City's zoning ordinance. In addition this arrangement should be a permanent one that will last through changes in ownership and use of the adjacent private facilities. If this approach is used, these arrangements should be in place before construction of facilities that would limit providing adequate parking is allowed.

Constraints
Providing this lot uses space which could be used as passive open space adjacent to the renovated ponds.

SCHEME B
Opportunities
This lot provides 12 spaces and it lessens the parking shortfall created from the existing park and the 20 additional spaces required for the new senior field

The shortfall may be greatly reduced by using shared parking concepts as described in the opportunities section of Scheme A above.

Constraints
This parking design falls substantially short (40 spaces) of providing adequate parking on site for the existing and proposed facilities in this scheme.

Amphitheater/Outdoor Classroom

SCHEME A
Opportunities
An amphitheater within the park provides an outstanding opportunity to function as an outdoor classroom as well as serving the more traditional functions of such a facility in a public park.

Siting the amphitheater with proposed pond enhancements, viewing decks and interpretive kiosks would further enhance the environmental education aspect of such a facility.

Constraints
Providing this facility will not leave sufficient room to develop an additional senior league field.

The amphitheater needs to be situated within a short walking distance to parking area for event attendees. In addition, potential conflicting noises, views, and events need to be mitigated either through scheduling buffers, and/or siting.

Security is another constraint on the siting of such a facility. It needs to be designed and sited in a fashion that will not encourage unauthorized use.

SCHEME B
Opportunities
This element is not included in scheme B due to the lack of sufficient space and a good site.

Constraints
This element is not included in scheme B due to the lack of sufficient space and a good site.

New Senior League Field

SCHEME A

Opportunities

This element is not included in scheme A due to the lack of sufficient space.

Constraints

This element is not included in scheme A due to the lack of sufficient space.

SCHEME B

Opportunities

An additional ballfield in the area of the existing Laguna Youth Park would provide temporary relief from the critical need for senior league fields that the Sebastopol Little League is experiencing. Furthermore, there would be little or no capital improvement and maintenance cost to the City, because the Sebastopol Little League will take on these responsibilities.

Constraints

Because of a lack of sufficient area, the addition of a senior league field would eliminate the grouping of an amphitheater, viewing deck and interpretive kiosk adjacent to the renovated ponds as and environmental education facility.

This facility will add a minimum of an additional 20 spaces to the existing parking shortfall at the site.

This is not a desirable use adjacent to the open water aspect of the renovated ponds. In addition the ballfield will not allow the possible expansion of the renovated ponds as shown in Scheme A.

The addition of a new senior league field will also require the relocation of the City corporation yard off the site.

Native Tree Buffer

SCHEME A

Opportunities

This element will provide necessary screening between some of the passive and active elements of the park. In addition it will provide valuable additional wildlife habitat.

Constraints

the deciduous trees in the buffer may increase the maintenance aspects of some of the adjacent active use areas.

SCHEME B

Opportunities

Same as Scheme A

Constraints

Same as Scheme A

Renovated Ponds

SCHEME A

Opportunities

The City is currently under direction from the U.S. Army Corps of Engineers to remedy the unauthorized fill in one of the existing sewer ponds. Renovation of the sewer ponds into a less rigid water feature with associated wetlands would provide the opportunity to comply with the Corps while gaining additional benefit from the expense.

The renovated ponds will also offer an opportunity for use as an outdoor classroom. The existing water control gate offers an opportunity for controlled experiments and studies within the ponds to study the effects of water level on marsh habitat.

In addition, the shallow gradients of the adjacent access roads offer an excellent opportunity to develop handicap accessible trails, thus allowing access to marsh and riparian habitat to physically limited park users.

The DFG has requested that the dike separating pond 5 from the Laguna and the dike separating ponds 4 and 5 be breached

to allow for the Laguna to flow freely into them. This solution is on hold pending the outcome of the Master Plan.

Constraints
The character of the fill in the ponds is unknown. Removal of the fill beyond what the Corps requires could prove costly if the fill is contaminated. The best way to determine if there is such a problem is to have a testing laboratory performs tests on samples taken from the site.

One of the old sewage ponds has been reserved by the City as an emergency storage pond for apple waste when Barlow filed is too flooded or wet to irrigate effluent. This use is compatible with restoration goals only if it occurs very infrequently (less than once a year for no more than a week).

SCHEME B
Opportunities
Same as Scheme A

Constraints
Same as Scheme A

Interpretive/Nature Trail Bridge

SCHEME A
Opportunities
This will provide an extremely important connection to the Barlow Field site and other trails in the park.

Constraints
The bridge design will have to be acceptable to flood control regulatory agencies

SCHEME B
Opportunities
Same as Scheme A

Constraints
Same as Scheme A

Relocated City Storage Yard

SCHEME A
Opportunities
The proposed relocation will create a much better use relationship between this element and the rest of the park.
Constraints
There are no significant constraints

SCHEME B
Opportunities
This element was not included due to lack of sufficient room.

Constraints
A new location off of the Laguna Youth Park site will have to be found for this element.

Handicap Accessible Interpretive Path

SCHEME A
Opportunities
This facility will provide an excellent opportunity to develop handicap access to the Laguna and its' environs in a cost effective manner. This facility will also be an important addition to the environmental education concept discussed in the amphitheater analysis.

Constraints
There are no significant constraints for this element.

SCHEME B
Opportunities
Same as Scheme A

Constraints
This scheme will limit the path to one side of the renovated ponds thus substantially reducing the length of path.

Interpretive Center

An Interpretive Center was not included in either scheme because the site constraints were considered to be to severe. However, and interpretive center is an important element in

the education and management aspects of the Laguna and future sites beyond the immediate planning area or future opportunity acquisitions should be considered.

Opportunities

An interpretive center would provide an excellent focus point for environmental education and Laguna management. The facility could include an indoor auditorium which would allow year round environmental education. A bookstore could also be included in the building to provide a source of funding for programs and maintenance.

Constraints

A suitable site on existing publicly owned land is not available in the current study area. Due to the unknown nature of the fill in the area of the former sewer ponds and because of the site's location within the 100 year flood plain, construction in the area of the existing Laguna Youth Park is undesirable.

APPENDICES

APPENDIX 1 VEGETATION SAMPLES FROM THE SEBASTOPOL-LAGUNA MASTER PLAN STUDY

Table 1. Plant Community: Vernal Pool Sample Number 1 (Releve: 040501). Date: 4/5/91

Abundance[1]	Scientific Name	Common Name	WetlandStatus [2]	Native Status[3]
4.0	Hordeum hystrix	mediterranean barley	FAC	I
0.5	Juncus phaeocephalus v.panicul	brown head rush	FACW	N
0.5	Lolium perenne	perennial rye grass	FAC*	I
1.0	Ranunculus muricatus	spiny buttercup	FACW+	I
2.0	Rumex crispus	curly dock	FAC-	I

Table 2. Plant Community: Sedge Bed Sample Number 2 (Releve: 040502).

Abundance	Scientific Name	Common Name	WetlandStatus	Native Status
4.0	Carex obnupta	slough sedge	OBL	N
3.0	Elymus triticoides	creeping wildrye	FAC+	N
2.0	Foeniculum vulgare	fennel	FACU	I

Table 3. Plant Community: Sedge Bed Sample Number 3 (Releve: 040503).

Abundance	Scientific Name	Common Name	WetlandStatus	Native Status
5.0	Carex obnupta	slough sedge	OBL	N
0.5	Phalaris tuberosa stenoptera	harding grass	FACU	I

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[1] Abundance is based on the mid-point of the cover class for each species. Cover classes are: 5 = 75-100%, 4 = 50-75%, 3 = 25-50%, 2 = 5-25%, 1 = 1-5%, + = < 1%, r = trace (Mueller-Dombois and Ellenberg, 1974).

[2] Wetland indicator status codes of plants are taken from the National List of Plant Species that Occur In Wetlands: California (Region 0) (Reed, 1988). Wetland indicator codes are defined as follows: OBL = obligate wetland plants that occur almost always in wetlands (estimated probability > 99%) in wetlands, FACW = facultative wetland plants that usually occur in wetlands (estimated probability 67-99%), but occasionally occur in non-wetlands, FAC = facultative plants that are equally likely to occur in wetlands or non-wetlands (estimated probability 34-67%), FACU = facultative upland plants (estimated probability (67-99%), UPL = upland plants that occur almost always (estimated probability > 99%) in nonwetlands. A positive sign (+) indicates a frequency toward the higher end of the category (i.e. more frequently found in wetlands). A negative sign (-) indicates a frequency toward the lower end of the category (i.e. less frequently found in wetlands). An asterisk (*) following a wetland indicator status identifies tentative assignments based on limited information.

[3] N = native plant, I = introduced (non-native) plant.

Table 4. Plant Community: Riparian Woodland. Sample Number 4 (Releve: 040601).

Abundance	Scientific Name	Common Name	WetlandStatus	Native Status
0.5	Atriplex patula	fat hen	FACW	I
0.5	Barbera orthoceras	winter cress	FACW	N
2.0	Carex obnupta	slough sedge	OBL	N
1.0	Carex spp.	sedge	N	
0.5	Chlorogalum pomeridianum	soap plant	N	
0.1	Eryngium aristulatum	Cal. coyote thistle	OBL	N
2.0	Fraxinus latifolia	Oregon ash	FACW	N
1.0	Grasses			
0.5	Juncus patens	rush,wiregrass	FAC	N
0.5	Plantago lanceolata	English plantain,ribgrass	FAC-	I
0.5	Polygonum punctatum	swamp smartweed	OBL	N
0.1	Prunus spp.	plum	?	
3.0	Quercus lobata	valley oak	FAC*	N
2.0	Rosa californica	wild rose	FAC+	N
2.0	Rubus vitifolius	Cal. blackberry	FACW*	N
1.0	Rumex crispus	curly dock	FAC-	I
2.0	Salix lasiandra	yellow willow	OBL	N
0.1	Sanicula crassicaulis	Pacific snakeroot	N	
2.0	Symphoricarpos albus	snowberry	FACU	N
0.1	Taraxacum officianale	dandelion	FACU	I
1.0	Toxicodendron diversilobum	sumac	N	

Table 5. Plant Community: Annual Grassland. Sample Number 5 (Releve: 041901).

Abundance	Scientific Name	Common Name	WetlandStatus	Native Status
1.0	Avena barbata	slender wild oat		I
0.5	Brassica campestris	field mustard		I
2.0	Bromus diandrus	rip-gut brome		I
3.0	Bromus mollis	soft chess	FACU-	I
2.0	Convolvulus arvensis	bindweed		I
0.5	Eschscholzia californica	California poppy		N
2.0	Festuca dertonensis	fescue		I
0.5	Geranium dissectum	wild geranium		I
2.0	Hordeum hystrix	mediterranean barley	FAC	I
0.5	Hypocharis radicata	cats ear		I
2.0	Lactuca serriola	prickly lettuce	FAC	I
0.1	Lupinus spp.	lupine		N

1.0	Picris echioides	ox tongue	FAC*	I
0.5	Plantago lanceolata	English plantain,ribgrass	FAC-	I
1.0	Rumex acetosella	sheep sorrel	FAC-	I
0.5	Rumex pulcher	fiddle dock	FAC+	I

Table 6. Plant Community: Vernal Pool. Sample Number 6 (Releve: 041902).

Abundance	Scientific Name	Common Name	WetlandStatus	Native Status
3.0	Eleocharis palustris	spiked sedge	OBL	N
1.0	Eryngium aristulatum	Cal. coyote thistle	OBL	N
2.0	Juncus phaeocephalus v.panicul	brown head rush	FACW	N
1.0	Limnanthes vinculans	Sebastopol meadowfoam	OBL*	
1.0	Mentha pulegium	pennyroyal	OBL	I
1.0	Plagiobothrys specie	popcorn flower		N
3.0	Pleuropogon californicus	semaphore grass	OBL	N
2.0	Ranunculus Lobbii	aquatic buttercup	OBL	N
0.5	Rorippa curvisiliqua	yellow cress	OBL	N
2.0	Rumex crispus	curly dock	FAC-	I

Table 7. Plant Community: Vernal Pool. Sample Number 7 (Releve: 052201).

Abundance	Scientific Name	Common Name	WetlandStatus	Native Status
2.0	Anthemis cotula	dog fennel	FACU	I
2.0	Cynodon dactylon	bermuda grass	FAC	I
0.5	Cyperus eragrostis	nut-sedge	FACW	N
1.0	Eryngium aristulatum	Cal. coyote thistle	OBL	N
3.0	Hordeum hystrix	mediterranean barley	FAC	I
0.5	Lasthenia burkei	Burke's goldfields	OBL	N
2.0	Lasthenia glaberrima	smooth lasthenia	OBL	N
0.5	Lobelia cardinalis	fog fruit	OBL	I
2.0	Mentha pulegium	pennyroyal	OBL	I
2.0	Plantago major	common plantain	FACW-	I
1.0	Poa annua	annual bluegrass	FACW-	I
1.0	Rorripa palustris	bog yellow-cress	OBL	N
2.0	Rumex crispus	curly dock	FAC-	I
1.0	Xanthium spinosum	spinyclotbur,spanish t	FAC+	I

Table 8. Plant Community: Vernal Pool. Sample Number 8 (Releve: 052202).

Abundance	Scientific Name	Common Name	WetlandStatus	Native Status
0.5	Carex obnuptaslough sedge	OBL	N	

1.0	Crypsis niliaca	prickle grass	OBL	I
2.0	Eleocharis palustris	spiked sedge	OBL	N
2.0	Eryngium aristulatum	Cal. coyote thistle	OBL	N
0.5	Lasthenia burkei	Burke's goldfields	OBL	N
3.0	Lasthenia glaberrima	smooth lasthenia	OBL	N
3.0	Lobelia cardinalis	fog fruit	OBL	I
3.0	Plagiobothrys species	popcorn flower	OBL(?)	N
1.0	Rorripa palustris	bog yellow-cress	OBL	N
1.0	Rumex crispus	curly dock	FAC-	I
0.5	Xanthium spinosum	spinyclotbur,spanish t	FAC+	I

Table 9. Plant Community: Vernal Pool. Sample Number 9 (Releve: 052203).

Abundance	Scientific Name	Common Name	WetlandStatus	Native Status
2.0	Eleocharis palustris	spiked sedge	OBL	N
2.0	Eryngium aristulatum	Cal. coyote thistle	OBL	N
0.5	Hordeum brachyantherum	meadow barley	FACW	N
0.5	Lasthenia	burkeiBurke's goldfields	OBL	N
2.0	Lasthenia glaberrima	smooth lasthenia	OBLN	
0.5	Lobelia cardinalis	fog fruit	OBL	I
2.0	Lolium perenne	perennial rye grass	FAC*	I
0.5	Mentha pulegium	pennyroyal	OBL	I
2.0	Plagiobothrys species	popcorn flower	OBL(?)	N
2.0	Pleuropogon californicus	semaphore grass	OBL	N
0.5	Rorripa palustris	bog yellow-cress	OBL	N
2.0	Rumex crispus	curly dock	FAC-	I

Table 10. Plant Community: Perennial Grassland. Sample Number 10 (Releve: 052204).

Abundance	Scientific Name	Common Name	WetlandStatus	Native Status
4.0	Hordeum brachyantherum	meadow barley	FACW	N
1.0	Rumex crispus	curly dock	FAC-	I

APPENDIX 2 FISHERY RESOURCES

This appendix provides detailed discussion of fishery resource factors relevent to the Sebastopol Laguna MAster Plan study area. This synthesis of information draws heavily on previous work unpublished work of Jennifer Neilsen and previous studies (Smith, 1989; Waaland et al, 1990).

Table 1. Fish Species Collected in the Laguna de Santa Rosa (Waaland et al, 1990)

Family	Scientific Name	Common Name
Catostomidae	Catostomus occidentalis	Sacramento sucker
Centrarchidae	Lepomis macrochirus*	Bluegill
	Lepomis microlophus*	Redear sunfish
	Lepomis cyanellus*	Green sunfish
	Pomoxis annularis*	White crappie
	Micropterus salmonides*	Largemouth bass
Cyprinidae	Orthodon microlepidotus*	Sacramento blackfish
	Cyprinus carpio*	Carp
	Hesperoleucus symmetricus	California roach
	Ptychocheilus grandis	Sacramento squawfish
Cottidae	Cottus asper	Prickly sculpin
	Cottus gulosus	Riffle sculpin
Embiotocidae	Hysterocarpus traski	Tule perch
Gasterosteidae	Gasterosteus aculeatus	Threespine stickleback
Ictaluridae	Ictalurus catus*	White catfish
	Ictalurus melas*	Black bullhead
Petromyzontidae	Lampetra tridentata	Lamprey
Poeciliidae	Gambusia affinis*	Mosquitofish
Salmonidae	Oncorhynchus mykiss	Steelhead, rainbow trout

*Introduced species

Types of Aquatic Habitat

The type and quality of aquatic habitat are important factors controlling the species, numbers, and age classes of fish inhabiting any aquatic system. Aquatic habitat is the result of historic discharge impacts on channel geomorphology, current water flows, and existing "roughness" elements, including live vegetation, dead organic debris, and geologic material, both instream and at the stream margin. All these factors contribute to the formation of diverse aquatic habitat types.

A study of aquatic habitat in the Laguna de Santa Rosa was conducted between October and December, 1989. Habitats were classified as follows:

- Backwater pools
- Lateral scour pools
- Thalweg pools
- Secondary channel pools
- Lentic wetlands or ponds
- Low gradient riffles
- Cascades
- Glides

Habitat Descriptions

Aquatic habitat falls into three major categories: pools, riffles and glides. Each habitat type reflects a different hydraulic relationship between the river flow and the general geomorphology of the stream bed.

Four pool types, two riffle types, and glides were found in the Laguna. Backwater eddy pools are depicted as pools formed by a circular current of water diverging from, and initially flowing contrary to, the main channel current. These pools are usually formed at a point at which the flow passes some obstruction on the inside of river meanders

Lateral scour pools are formed by the scouring action of high flows, directed laterally or obliquely to one side of the stream along the bank, or to some obstruction at the channel margin . Thalweg scour pools are scoured by high flows along the central channel. The thalweg is defined as the site of maximum scour along the stream bed. These pools are characterized by relatively long central depressions in the stream bed, often with heavy sediment deposition at the downstream end of the pool forming long shallow pool tail-outs.

Secondary channel pools are relatively small, centrally- scoured pools separated from the mainstem of the stream by gravel bars or vegetated mud banks. These pools are usually fed

by small surface riffles upstream of the pool and flows return to the main channel some distance downstream.

Low gradient riffles (less than 4 degrees of gradient) represent the bulk of the riffle areas found in this study. Riffles are shallow areas where the water flows swiftly over completely or partially submerged substrate materials, producing surface agitation. Cascade habitat, found only at one site in this survey, is characterized by swift current flowing over exposed rocks or boulders at a high gradient. Considerable turbulence and surface agitation are created as the flows fall through a series of stepped drops in the substrate .

Glides are characterized as areas of slow moving water with a relatively uniform depth across the entire channel. The slope of the water surface is roughly parallel to the overall gradient of the stream reach.

Distribution of Aquatic Habitat

The general distribution of the three major categories (pools, riffles and glides) is shown in . Pools dominate all the survey sites in the study area, but riffles also occur often at Todd Road. A brief description of all the sites within or adjacent to the study area follows.

Laguna at Occidental Road (L3[4]). This site is centered at Occidental Road. The Laguna begins to pass through large oxbows, still flowing over the soft muds and gravels of a valley floor stream. Large organic debris occurs occasionally as logs and rootwads on the stream margin. The overflow of spring-fed tributaries continues to carry soft sediments from grazed fields into the Laguna channel. Erosion is obvious on cutbanks at stream meanders. The channel braids into smaller secondary channel streams around long flat mud bars downstream from erosion areas. Thalweg pools at this site are long and relatively deep, creating quasi-lentic environments.

Riffles in this reach are often clogged with mud and fine organic debris. Most clean riffles are part of secondary channels at stream braids. Glides are also dominated by mud and cobble substrata.

Laguna at Highway 12. Dense riparian vegetation surrounds the Laguna as it flows through this site at Highway 12. Willow and cottonwood trees and rootwads cling to the banks, creating numerous lateral scour pools and many backwater eddies. Large thalweg pools are lined with overhanging vegetation. Banks are deeply cut at the stream meanders not covered

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[4]L3, L4 and L5 refer to study site identification in Waaland et al, 1990.

in brush and trees. Large swampy areas occur throughout this reach where the Laguna is not channelized.

Few riffles occur in this reach. The channel's longitudinal gradient is low (less than 2 degrees), leaving large slack water areas and minimal gradient drops to create riffle habitat. Aquatic vegetation is abundant in several of the thalweg pools. Flooded grasses and shrubs line the areas of slack water. Several shallow tributaries enter the main Laguna around the City of Sebastopol, carrying accumulations of trash and litter into the Laguna.

Laguna at Todd Road. The Laguna de Santa Rosa upstream and downstream of Todd Road has a classic stream habitat assemblage. Thalweg pools still dominate the assemblage, but higher proportions of diverse pool types occur. Riffles increase in abundance, and at this site had a combination of clean gravel and cobble substrata, despite evidence of grazing and bankcuts in the lower reach. Gravels form natural bars, splitting the channel into braids at several locations. At the flow levels during the survey many of these braids were dry, except at the downstream end, where they formed backwater eddies.

Lateral scour pools in this site are formed at bankcuts along stream meanders. Overhanging vegetation dominates the available cover in this reach, with limited evidence of rootwad cover when willows grow along the stream. Two small glides were surveyed in the upper reach, and two major tributaries enter the Laguna in this site. Both carry small amounts of sediment and appear to be similar to the mainstem in habitat assemblage.

Cover

Five types of cover were recorded on the Laguna de Santa Rosa and the lower tributaries. A total of 73.6 percent of the surface area surveyed was associated with one or more cover types (Table 2). Riparian vegetation lined the stream banks on 27 percent of the stream surface area surveyed. Overhanging willows (Salix spp.), alder (Alnus rubra), oak (Quercus spp.), and cottonwood (Populus spp.) trees comprised the bulk of the overhead vegetation. Various shrubs and grasses contributed to the cover along the bankcuts at river meanders. Reeds (Phragmites communis), rushes (Scirpus robustus), and cattails (Typha spp.) grew in large clumps along the stream banks and on islands in several study reaches. Riparian plants provide cover for fish and small amphibians from avian predators, and shade the river from solar heating during the day. An increase in the available riparian cover along the banks of the Laguna, especially in the channelized areas, may increase natural fish production by providing additional cover and stream temperature moderation during summer.

Aquatic vegetation serves a similar purpose for instream fish, and provides habitat for various aquatic invertebrates which serve as food for different fishes. Aquatic vegetation also provides refuge from instream predators of fish, such as larger fish, river otters, and

aquatic garter snakes. Laguna-2 had large areas of rooted aquatic vegetation, primarily Alisma aquatica-plantago, a common freshwater plantain.

Table 2. Cover Associations as a Percent of Total Surface Area.

Cover Association	Surface Area (m2)	% Total
Riparian Vegetation	43966.25	27.3
Aquatic Vegetation	39697.31	24.6
Bankcut	24818.56	15.4
Roots	5518.60	3.4
Large Organic Debris	3372.70	2.1
Rocks	1265.02	0.8
TOTAL	118638.44	73.6

Large organic debris and rootwads were found associated with numerous bankcuts and lateral scour pools, contributing cover to over 8,000 square meters of stream. Organic debris is well documented as significant cover necessary for the production of cool water salmonids (Bisson et al. 1982; Platts et al. 1987). Only rock cover was infrequent in the study area. Most rock cover was formed by riprap at bridge crossings and along eroded banks. Rock cover is an important factor in the overwintering of most trout species, including juvenile anadromous steelhead (J.L. Nielsen, unpublished data).

Substrate

Historically, the substrate composition, especially in riffles, is considered when evaluating aquatic habitat for two reasons. Fish frequently select specific substrate types for building nests or redds. Typically, warm water fish (perch, bass and sunfish) breed on soft substrata among vegetation, while cold water fish (salmon and trout) breed in open flowing water on clean gravels.

Macroinvertebrates also use the substrate for habitat in streams. Riffles have long been known to be sites of significant secondary production in the form of aquatic invertebrates (Platts et al. 1987). These aquatic invertebrates contribute enormously to the food resources available for fish. Mud, gravel, and cobble substrata all provide habitat for different invertebrate groups utilized by various fish species for food. Aquatic

invertebrates were not collected for this study, so associations between substrate type and fish food availability can not be addressed directly.

Because the Laguna de Santa Rosa flows through a wide valley floor and has an overall low stream gradient (a longitudinal gradient of less than 2 degrees), sediments will tend to remain in the channel. Mud and sand substrata were evident throughout the Laguna. Gravels were also common in the Laguna, but often mixed with soil and fine organics. These substrata provide breeding opportunities for many warm water fishes (but not salmonids).

Blucher Creek and possibly Crane and Copeland Creeks have gravel substrates which may provide spawning habitat for salmonids.

Diversity

A simple index of habitat diversity was calculated for the ten study reaches in this survey, as the average number of habitat changes for each ten meters of stream within a three hundred meter reach. Diversity should be considered as a relative number, representing the number of changes in habitat type within a specific distance of stream (300 meters). Each habitat type supports a different hydraulic environment, providing habitat preferred by different species of fish (Bisson et al. 1982; Sullivan 1986). Since each habitat type may also serve as an important component for different life history phases in any one species, habitat diversity may also represent the stream's ability to support fish of different age classes. Thus, a habitat diversity index can be considered a relative quantitative estimate of fish potential. A higher diversity of habitat can be assumed to provide space for a more diverse fish assemblage.

Mark West Creek and Laguna-5 (Todd Road) have diversity indices over .5, implying that, on average, one habitat change occurs every twenty meters. This diversity is typical of Northern California streams with historic anadromous fish runs (J.L. Nielsen, unpublished data).

Another measure often applied to aquatic habitat distributions on streams is the pool-riffle ratio. These primary components of aquatic habitat are thought to occur equally in the most productive freshwater salmonid streams (Platts et al. 1987). A 1:1 ratio provides sufficient pool habitat for living and resting space for trout and salmon, and sufficient riffle habitat for aquatic invertebrate production to feed these fish. The pool-riffle ratios for all ten study reaches are given by thalweg length and surface area in Table 3. Mark West Creek at Slusser Road (MW-1) has the best ratio at 3:1. Laguna site #4 has the worst ratio (303:1), because the stream at Highway 12 is dominated by large, lentic pools. Site #4 is better suited for warm water pelagic species.

Pool-riffle ratios must be considered with the total microhabitat assemblage for analysis of fish utilization. As suggested above, microhabitats serve different purposes for individual fish of different ages. When pool-riffle ratios are coupled with an understanding of how habitats are used by resident fish species within the system, a better estimate of enhancement potential can be made.

Table 3. Pool-Riffle Ratio for Each Site Calculated by Thalweg Length and Surface Area.

Site Number	Length (m) Pool:Riffle	Surface Area (m2) Pool:Riffle
L-1	18:1	45:1
L-2	44:1	60:1
L-3	19:1	54:1
L-4	89:1	303:1
L-5	4:1	5:1
L-6	16:1	53:1
L-7	28:1	69:1
MW-1	4:1	3:1
MW-2	29:1	43:1
SR-1	8:1	13:1
TOTAL	17:1	30:1

Conclusions

The following discussion summarizes significant factors affecting the fishery resources of the study area.

- Aquatic habitat on the lower Laguna de Santa Rosa is dominated by large thalweg scour pools compatible with the warm water fish assemblage found at this site.

- The Laguna near Todd Road has pool habitat and habitat diversity indices comparable to second and third order streams in other basins in Northern California. This reach of

the Laguna could provide pool habitat necessary for production of cool water stream fishes such as steelhead.

- Riffle habitat was found to be potentially limiting to cool water fish production within the Laguna system, but was relativley abundant near Todd Road.

- Vegetative cover (in-stream aquatic or above-stream riparian) is relatively abundant in the study area. These two cover types contribute to the success of the fish species present by providing spawning refuge, predation protection, and as substrate for invertebrate food resources. Salmonid juveniles are known to be rearing in the backwater riverine habitats of the study area where they are sensitive to elevated summer temperatures. Increases in riparian cover along parts of the main Laguna may improve juvenile salmonid rearing potential.

- Rock cover, which provides a significant contribution to the overwintering habitat and year- round predation protection for juvenile salmon and trout, was found lacking in the Laguna de Santa Rosa system. Additional rock cover may increase juvenile salmonid production.

- Owing to the low gradient of the Laguna basin, the available substrata are often dominated by mud and sand, most compatible with warm water fish production. Clean gravels needed for reproduction by rainbow and steelhead trout were limited to sites on Mark West Creek, but may also occur in Blucher Creek, Crane Creek and Copeland Creek.

- Habitat diversity and pool-riffle ratios in the Laguna were significantly better downstream of the study area at Todd Road than within the study area. These data imply that habitat factors limiting Laguna fish production may be more significant within the study area than surther downstream.

APPENDIX 3 POTENTIALLY OCCURING SPECIES OF CONCERN

Table 1. Rare, threatened or endangered plant species known to occur in the project region.

Scientific Name[5]	Common Name	CNPS[6]	RED[7]	Legal[8]	Habitat

[5]Table 3. Endnotes.

Species are listed as given by the California Native Plant Society (CNPS) (Smith and Berg, 1988).

[6] The CNPS number as defined in Smith and Berg (1988):

1A = Plants presumed extinct in California.
1B = Plants rare and endangered in California and elsewhere.
2 = Plants rare and endangered in California, but more common elsewhere.
3 = Plants about which we need more information - a review list.
4 = Plants of limited distribution - a watch list.

[7] The R-E-D code from Smith and Berg (1988):

R (Rarity)
1 = Rare but found in sufficient numbers and distributed widely enough that the potential for extinction or extirpation is low at this time.
2 = Occurrence confined to several populations or one extended population.
3 = Occurrence limited to one or a few highly restricted populations, or present in such small numbers that it is seldom reported.
* = Presumed extinct.

E (Endangerment)
1 = Not endangered.
2 = Endangered in a portion of its range.
3 = Endangered throughout its range.

D (Distribution)
1 = More or less widespread outside California.
2 = Rare outside California.
3 = Endemic to California.

[8] As designated by the California Department of Fish and Game (CDFG, 1984) under the California Endangered Species Act of 1984 and the Native Plant Protection Act of 1977 and the California Environmental Quality Act (CEQA):

		List	Code	Status	
Blennosperma bakeri	Baker's blennosperma	1B	2-3-3	E/E	Vernal Pools
Campanula californica	swamp harebell	1B	1-2-3	/C2	Marsh, Seeps
Carex albida	white sedge	1B	3-3-3	E/C1	Marsh
Castilleja uliginosa	Pitkin Marsh Indian	1B	3-3-3	E/C1	Marsh
Downingia humilis	dwarf downingia	1B	1-2-3	/C3c	Vernal Pools
Lasthenia burkei	Burke's goldfields	1B	3-3-3	E/E	Vernal Pools
Lilium pitkinense	Pitkin Marsh lily	1B	3-3-3	E/C1	Marsh
Limnanthes vinculans	Sebastopol	1B	2-3-3	E/E	Vernal Pools
Navarretia plieantha	meadowfoam many-flowered navarretia	1B	3-2-3	E/C2	Vernal Pools
Perideridia gairdneri ssp gairdneri	Gairdner's yampah	1B	1-2-3	/C2	Seasonal wetland
Pleuropogon hooverianus	North Coast semaphore grass	1B	3-2-3	R/C2	Seasonal wetland
Pogogyne douglasii ssp parviflora	Douglas' pogogyne	3	?-2-3	/C2	Vernal Pools
Rhynchospora alba	white beaked-rush	4	1-1-1		Marsh

R = Rare, E = Endangered.

As listed by the U.S. Fish and Wildlife Service (USFWS, 1986) under the Federal Endangered Species Act of 1973, as amended:

E = Formally listed as Endangered.
C1 = Enough data are on file to support the federal listing.
C2 = Threat and/or distribution data are insufficient to support federal listing.
C3c= Too widespread, or not threatened.

Rhynchospora californica	California beaked-rush	1B	3-3-3	/C2	Marsh
Rhynchospora globularis var globularis	round-headed beaked-rush	2	3-3-1		Marsh
Trifolium amoenum	showy Indian clover	1A	*	/C2	Grassland

Table 2. Rare, threatened or endangered wildlife species known to occur in the project region.

COMMON NAME	SCIENTIFIC NAME	C1 FE	FT	/2	CE	CT	CP	CSC	BL
Great blue heron*	Ardea herodias	_	_	_	_	_	_	_	_
Great egret*	Ardea occidentalis	_	_	_	_	_	_	_	_
Snowy egret*	Leucophoyx thula	_	_	_	_	_	_	_	_
Black-crowned night heron*	Nicticorax nycticorax	_	_	_	_	_	_	_	_
Wood duck*	Aix sponsa	_	_	_	_	_	_	_	_
Cooper's hawk*	Accipiter cooperi	_	_	_	_	_	_	X	_ X
Sharp-shinned hawk*	Accipiter striatus	_	_	_	_	_	_	X	_ X
Golden eagle*	Aquila chrysatos	_	_	_	_	_	X	X	_ _
Northern harrier*	Circus cyanus	_	_	_	_	_	_	X	_ X
Black-shouldered kite*	Elanus leucurus	_	_	_	_	_	X	_	_ _
Bald eagle*	Haliaeetus leucocephalus	_	_	_	X	_	X	_	_ _
Osprey*	Pandion haliaetus	_	_	_	_	_	_	X	_ X
Northern goshawk*	Accipiter gentilis	_	_	_	_	_	_	X	_ _
Prarie falcon*	Falco mexicanus	_	_	_	_	_	X	X	_ _
Peregrine falcon*	Falco peregrinus	_	X	_	_	X	_	X	_ _
Merlin*	Falco columbarius	_	_	_	_	_	_	X	_ X
Cal. yellow-billed cuckoo*	Coccyzus americanus	_	_	_	_	X	_	_	_ _
Burrowing owl*	Athene cunicularia	_	_	_	_	_	_	X	_ X
Short-eared owl*	Asio flammeus	_	_	_	_	_	_	X	_ X
Long-eared owl*	Asio otus	_	_	_	_	_	_	X	_ _
Willow flycatcher*	Empidonax trailii	_	_	_	_	_	_	X	_ _
Purple martin*	Progne subis	_	_	_	_	_	_	X	_ X
Tri-colored blackbird	Ageliaus tricolor	_	_	_	_	_	_	X	_ _
Yellow warbler*	Dendroica petechia	_	_	_	_	_	_	X	_ X

Yellow-breasted chat*	Icteria virens							X		X	
California gull*	Larus californicus							X			
Caspian tern *	Hydroprogne caspia										
Townsend's western big-eared bat	Plecotus townsendii			X				X			
American badger*	Taxidea taxus							X			
Ringtail cat	Bassaricus astutus						X				
Western pond turtle*	Clemys marmorata pallida			X				X			
Red-legged frog	Rans aurora draytoni			X				X			
Foothill yellow-legged frog	Rana boylei							X			
California tiger salamander	Ambystoma tigrinum			X				X			
California freshwater shrimp	Syncaris pacifica		X			X					

Table 2. Continued.

COMMON NAME	SCIENTIFIC NAME	FE	FT	C1 /2	CE	CT	CP	CSC	BL
California linderiella	Linderiella occidentalis			X					
Valley oak ant	Proceratium californicum			X					
Ancient ant	Smithistruma reliquia			X					

Table 4. Endnotes.

Those species without any "X" are considered "special animals" by the California Natural Diversity Data Base.

* = Animals observed in the Laguna vicinity. Bird species from Bollander's List (de Mars et al, 1977). Other sightings by the author or reported in Waaland et al, 1990)

FE = federally listed endangered
FT = federally listed threatened
C1/2 = species on either federal list one or list two as a "candidate" for listing
CE = state listed endangered
CT = state listed threatened

CP = CDFG "fully protected" species (Sec. 4700, Chapt. 8; Sec. 5050, Chapt. 2; Div 6, Chapt. 1, Sec 5515)

CSC= CDFG species of special concern. These species face immediate extirpation in their entire California population, are on the decline in a large portion of their range, or occur in very small populations within the state. Bird Species of Special Concern appear in Remsen, 1978.

BL = species appears in Audubon Society's "The Blue List for 1978" (Arbib, 1977)

APPENDIX 4 SEBASTOPOL LITTLE LEAGUE FACTS

1. SLL has spent $175,00 since 1985 on field development, improvement and maintenance.

2 SLL pays for monthly maintenance of Ives park field and both fields at the Laguna Youth Park.

3. SLL pays for all repairs and improvements at these fields.

4. average cost of development per field is approximately $35,000.

5. SLL makes fields available for many other community uses.

6. In 1985, there were 568 kids in SLL. In 1991, there are 1140 kids in SLL.

T-ball	16 teams of 15 players=	240 kids
8 yrs	10 teams of 14 players=	140 kids
9-10 yrs	14 teams of 14 players=	196 kids
Farms (9-12 yrs)	14 teams of 14 players=	196 kids
Majors (10-12 yrs)	10 teams of 12 players=	120 kids
Minor seniors (13-14 yrs.)	10 teams of 14 players=	140 kids
Major seniors (13-15 yrs)	6 teams of 12 players=	72 kids
Big league (16-18 yrs)	2 teams of 18 players=	36 kids
Total number of kids 1991/92		1140 kids

7. Field use is determined by size specification required by each age group

8. SLL is asking for the use of an area approximately 400 ft by 400 ft which is NW of the Community Center on the sewage pond filled with road debris and other materials. SLL is not asking for any money fro field development or maintenance.

Age	Number of Teams	Game Fields
8 yrs	10	Parkside
9-10 yrs	14	Ragle
	14	AHS girls' softball
10-12 yrs	24	Ives
	24	Clahan
13-18 yrs	21**	AHS varsity
	21	Laguna Youth Park

*age group most impacted. Growth projection for 1992 season in the 13-18 year old age group is 5 teams or 65 players

** This figure includes three high school teams

APPENDIX 5 SUMMARY OF CDPR SURVEY

In September of 1987 the California Department of Parks and Recreation published a survey entitled Public Opinions and Attitudes on Outdoor Recreation in California. The purpose of this survey was to provide information to public park and recreation officials, interest groups in the recreation and environmental fields and to concerned citizens.

The following are the major finding as described in the executive summary.

* The majority of Californians consider themselves outdoor persons (56.8)

* Roughly two-thirds of Californians consider public park and recreation areas important or very important to their life-styles

* Roughly 63 percent of Californians are satisfied with the public parks and outdoor recreation opportunities available to them

* Highly developed parks and recreation areas are visited the most often; however, nature-oriented parks or reserves are the preferred type of outdoor recreation areas

* In terms of general attitude, Californians strongly agree (76%) that protection of the natural environment is important for outdoor recreation, closely followed by preservation of natural areas for use by future generations (75%)

* Californians participate in a wide range of outdoor activities with varying degrees of avidity; such as walking (77%), driving for pleasure (76%), and visiting museums, zoos, historic sites and arboretums (72%)

* Conservatively, Californians spent a billion participation days in outdoor recreation in 1986

* Based on latent (unmet) demand and public support, Californians believe that eight outdoor recreation activities should have top priority for the expenditure of pubic funds: walking, bicycling, camping in developed sites with tent or vehicle, birdwatching/general nature study/visiting natural areas, picnicking in developed sites, beach activities, outdoor cultural events, and visiting museums/zoos/historic sites

* Californians tend to support funding park and recreation areas through "sin" taxes and increased fees for special facilities while opposing increases in general forms of taxation

* Increased entrance or user fees found its strongest support (68%) when the money is used only at the park where it was collected

* In light of tight budgets, almost three-fourths of Californians believed spending should be increased for the protection and management of natural and cultural resources. Increasing the protection of scenery and the natural environment was strongly supported by three-fourths of the respondents

* In terms of equity, Californians believe that higher priority by park and recreation agencies should be given to areas where existing facilities are most heavily used

* Californians tend to support the concept of using unpaid private citizens as park volunteers (85%). Of those individuals who had not volunteered, almost 64 percent indicated they would consider volunteering

* The majority of respondents indicated that it was appropriate for private firms to provide services in public parks; however, almost three-fourths (72%) did not believe private firms should be allowed to undertake the total operation and management of public park or recreation areas

* When park and recreation issues are involved, Californians are undeniably more similar than different; regardless of income, education, geographic location or gender, Californians tend to be much more alike in their opinions/attitudes and outdoor activities than different

* In terms of their desire for additional recreation opportunities and their support for government funding of appropriate facilities, Californians - when examined in a wide range of socioeconomic categories - appear to be more alike than different in their views

APPENDIX 6 ENVIRONMENTAL EDUCATION INFORMATION

The following is a summary of existing environmental education activities in Sonoma County (this information was provided by the Technical Advisory Committee

STUDENT ENROLLMENT, 1990-91

Westside Elementary Districts

Sebastopol Union	1,236
Oak Grove	5
Gravenstein	720
Twin Hills	897
Harmony	583
Forestville	746
Piner-Olivet	1,200
Wright	1,187
Roseland	850
Bellevue	1,238
	9,177

Other Districts

Analy High School	2,297
Cotati-Rohnert Park	6,300
Santa Rosa city schools	4,464
Santa Rosa High School	9,175
Total Student Population Base:	**31,413**

More than 640 Sonoma County teachers received special training in environmental education in the last 5 years. (So. Co. Office of Education)

The Sonoma County Office of Education receives 50 to 60 inquires a year from teachers about environmental education facilities.

Approximately 120 school children visit Kelly Demonstration wetlands each week during the school year. As many as 3,600 students, from elementary school through college, may visit the wetlands during the year. (Santa Rosa Dept. of Utilities)

The Terwilliger nature Van gave programs for 8,2000 school children in Sonoma County in 1990.

The Terwilliger Foundation desires to use the Laguna for docent-led field trips for school children. However, they are unable to use the Laguna due to insufficient access and trails. Currently they lead one tour a week at Spring Lake. They are expecting to serve about 900 students in the coming school year. There is more demand for the tour than they can meet, and classes are turned away.

There are 2 environmental education sites in in Sonoma County that provide tours and interpretive experiences: Fairfield Osborn Preserve, Penngrove, and Bouverie Audobon Preserve, Glen Ellen. The facilities are booked by the beginning of the school year and classes are turned away. The approximate cost for one bus to transport a class to these sites from Sebastopol is $125.00.

Environmental education is considered to be a high priority by many teachers and parents in West County. Last year, two third-grade classes raised enough money to attend a 2-day environmental education program at the Marin Headlands Institute. The cost was $65 per student (Greg Johnson, Pine Crest School, Sebastopol)

SCHOOL FIELD TRIPS

Sebastopol Union school District has three schools, grades K through 8. Field trips are paid for from donated money raised through the efforts of the teacher and parents in each class. The number of field trips a class can take depends on its fund raising success. Having an environmental facility within walking distance

of the schools will give more classes access to this educational experience.

The following information was obtained from the West Sonoma County Transportation Agency for the 1990-91 school year.

Park Side School (k-2) 25% of bus field trips were related to natural/environmental science, for a total cost of $1,462. Destinations included the Sonoma Coast, Armstrong Woods, and a tree nursery.

Pine Crest School (3-5) 46% of bus field trips were related to natural science, for a total cost of $2,471, and an average cost per trip of $112. destinations included the Sonoma Coast, Fairfield Osborn Preserve, Bouverie Audubon Preserve, the Bird Rescue Center, and Steinhart Aquarium.

Brook Haven School (6-8) 3% of bus field trips were related to natural/environmental science, for a total cost of $868. (It is interesting to note that 65% of the bus field trips were for athletics. The percentage is even higher for high school.)

Total Environmental Education Bus Trips (1990-91): **33**

Total Transportation Cost (190-91) **$4,801.00**

Note: The above figures include field trips related to natural science only. Trips to the Planetarium and Exploratorium, as well as to farms and dairies, were not counted.

APPENDIX 7 SUMMARIES OF PUBLIC WORKSHOP INPUT

Public Workshop #1 First Meeting

On June 22, 1991, Public Workshop #1 was held in Sebastopol regarding the Laguna de Santa Rosa Park Master Plan. This workshop was attended by approximately 30 people. Following are the suggestions and comments that were brought up during the public comment period:

1. The connection of the Laguna to the City and Businesses while incorporating a Community - Sensitive design is important.
2. Need a policy protecting uplands from future development.
3. Preservation of habitat with education as an element (interpretive signs, etc.).
4. Laguna park trail system needs to connect to city trail system.
5. Set up a policy to name trail after natural features
6. Connect trail to Ragle Park.
7. Develop separate equestrian trails of compacted earth material instead of A/C.
8. Public access trails that protect natural resources
9. Have unrestricted & Docent controlled trails.
10. Integrate cultural resources and historic properties.
11. Enhance "Gateway" effect at the east entrance to the city.
12. San Francisco/N. Pacific spur is a possible trail connection, need to check availability.
13. Remove the cement plant, Re-zone the buffer and restore it to it's natural habitat, perhaps when the use changes, seek purchase.
14. On industrially zoned land, seek lot-split and purchase. (Cement and Duri-glass site)
15. Remove trailer-use and acquire trailer park site for restoration. Use this portion as part of Laguna Park, while developing and relocating low-income housing elsewhere. Preserve "lower" and restore "upper"as a day-use picnic grounds.
16. Sewer ponds 3/4/5; need to work with CDFG to restore to a more viable wetland, in co-ordinance with USACE mitigation.
17. Develop "Laguna Interpretive Center", explaining use and value near existing Goodwill trailer site.
18. Re-evaluate existing Laguna interpretive center in the park.
19. Identify teen center/skateboard park on maps.
20. Issues of supervision and liability of skateboard park.
21. Swap ballfield with ponds 1&2, i.e. move North ballfield to the filled ponds 1&2, then restore as a package with ballfields 3&5.
22. Guidelines for landscaping of adjacent to "improve" wetland ordinance, (i.e. special mix).
23. Make ballfield design sensitive to bordering habitat.

24. Limit ballfields to only those now existing.

25. Site ballfield on a filled pond.

26. Research alternative ballfield locations.

27. Remove ballfields.

28. Seek County's agreement to manage channels for more resource sensitive management.

29. East-side trail should be dedicated for public access by responsible agencies, possibly docent guided.

30. Seek funding for CDFG to fence their Laguna Reserve.

31. Barlow field transferred to park whenever possible

32. Recommendations for building ordinance, design review to incorporate viewshed sensitivity.

Workshop #1 Second Meeting

On July 11, 1991, a second meeting of the first public workshop was held at the Sebastopol Veterans Hall. This workshop was attended by approximately 30 people. Following are the suggestions and comments that were brought up during the public comment period:

1. How will the plan implement Sebastopol Policy #58?

2. What are the ramifications of Highway 12 widening?

3. The Plan should estimate the economic benefits to the community, quality of life, etc.

4. Security is an important issue that the plan should address.

5. Should recreation inventory address other active recreation issues,i.e.: tennis courts.

6. Don't need anymore ballfields, need a passive orientation.

7. Address secondary ballfield impacts/(park traffic).

8. Active use conflicts with natural resources; we don't know what the relative number of potential and future actual passive users will be.

9. What are impacts of development on the filled pond?

10. Little League draws numerous players from county lands to the west.

11. Unconventional designs for access and parking to a new ballfield need to be explored.

Public Workshop #2

On August 29, 1991, a public workshop was held to present concept alternatives for the Laguna Park Master Plan. Approximately 65 people attended the meeting. The following are the main comments received from the public attending the meeting:

1. Who's paying for park improvements?

2. Is 200 ft. setback enough?

3. The money spent on prior ballfield renovation should not be wasted.

4. Move all active recreation elsewhere.

5. Need a minimum of 2 playable fields at all times.

6. Phasing will allow for temporary 3 fields.

7. Want a total of 3 permanent ballfields.

8. Plan 2 offers natural resource interpretation.

9. Keep the amphitheater.

10. City Council has the wrong attitude towards kids recreation.

11. Need to keep historical perspective of Little League efforts.

12. Trails are too intrusive, instead alternate sides and move back.

13. Move access and focus to the south side of Highway 12.

14. Buy land for passive recreation, use city owned land for ballfields.

15. No existing access to Laguna exists; need Nature Education Facilities.

16. City lands should be used for ecological enhancement.

17. The existing park is inappropriate for ecological enhancement, passive uses should be put into Barlow, etc.

18. We need active recreation to keep kids doing constructive things.

19. Want elevated pathways.

20 Provide handicap access wherever feasible on trails.

21. Want playground equipment preserved.

22. Basketball courts need to be maintained.

23. Parking impacts need addressing.

24. Equestrian access?

25. Need to accommodate active and passive uses, while enhancing ecology.

26. Not adequately considering the active uses.

27. Add third ballfield between the two ballfields.

28. Interpretive area in #2 not good - bad views, skateboard impacts.

29. What is planned for trailer park?

30. Access will have adverse impacts from public abuse of resources.

31. Can funding be found to blend improvements for both active and passive recreation?

32. County time horizon for a ball field complex is 5 - 10 years; cost $2 - 3 million , list of potential sites under consideration.

33. Can the addition of lighting take pressure off of the need for 3rd ballfield?

34. Historically, most ballfields have cost the City nothing.

35. Add a bridge at Plan 2 observation areas.

36. Move amphitheater to Barlow.

37. How will we ensure long-term resource management ?

38. Access (trails) will have a positive impact via increased awareness.

39. Moving ballfields will affect 1000 kids.

40. Move interpretive center to kiosk area.

41. Interpretive center too large.

42. Move amphitheater into the large ballfield, make it into a little league field, move adult field to filled site.

43. Move ballfields away from Laguna? Too late?

44. The area behind center field may be suitable for amphitheater.

45. Can baseball fields have multiple uses?

46. Make third ballfield temporary.

47. The plan does not give adequate attention to Laguna.

APPENDIX 8 PARKING REQUIREMENTS

USE	PARKING REQUIREMENT	SPACES REQUIRED
Existing Uses		
Community Center 4950 SF	1 space per 225 GSF*	22
Dance Hall 3,150 SF	1 space per 225 GSF*	14
Little League Field	Minimum 20 spaces per diamond, 30 preferred****	20
Senior League Filed	Minimum 20 spaces per diamond, 30 preferred****	20
Passive Park Area	5 spaces per acre***	5
Picnic Area	1 space per 4 patrons***	6
Proposed Uses		
Community Center Expansion 1800 SF	1 space per 225 GSF*	8
Teen Center 2,275 SF	1 space per 225 GSF*	10
Skate Board Park	TBD	TBD
Interpretive Center 2500 SF 60 Seat auditorium	1 space per 3 seats**	20
Amphitheater 60 Seats	1 space per 3 seats**	20
Passive Park	5 spaces per acre***	3
Group Picnic for 30 people	1 space per 4 patrons***	8

* City of Sebastopol Parking Ordinance dated 11/22/84 Item D.4

** City of Sebastopol Parking Ordinance dated 11/22/84 Item D.5

*** Recreation Park and Open Space Standards and Guidelines, National Recreation and Park Association 4th printing 1990

**** Time-Saver standards for Landscape Architecture Design and Construction Data, Copyright 1988

TBD To Be Determined